Journal of the Indian Medical Association

VOL. XVII, No. 11 CALCUTTA AUGUST, 1948

XERODERMA PIGMENTOSA WITH SPECIAL REFERENCE TO DOPA REACTION

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INTRODUCTION

Reports regarding the incidence of this disease in India are rare, even though much has been mentioned about it in the medical literature of the West since Kaposi's description of the disease in 1895. Stonham and Nagpaul (1941) have reported three cases from Punjab. It is probable that more cases are not reported because of the uncertain histogenesis of the disease and the futility of any form of treatment. No racial immunity to this disease seems to exist. Incidence of xeroderma pigmentosa in Negroes has also been reported by King and Hamilton (1940).

From a study of the available literature a few facts regarding the disease emerge.

(1) That the disease affects members of a family irrespective of sex.

(2) There is probably a congenital hypersusceptibility to the ultra-violet rays of the sun.

(3) The disease is seen among the brown pigmented, as well as the black pigmented races of the world.

This article is written in an endeavour to throw more light on the histogenesis of this disease, for frequently it is by observing the pathological changes in the tissue that the physiological functions are better understood.

In the present study special emphasis was placed on the dopa reaction as the primary reaction here to the irritant, probably the ultra-violet rays of the sun, is a great outpouring of the melanin pigment, by the melanoblast. Bruno Block, the eminent dermatologist of Zurich, was the first to demonstrate the specific dopa reaction for the actively functioning melanoblasts. Dopa is an abbreviation for 3, 4-dioxyphenylalanine, which is converted by a ferment in the melanoblast to dopa melanin, which closely resembles animal melanin.

Thus the dopa reaction is an indication of the presence of the melanin ferment, an oxydase in melanoblasts which normally convert the chromogen substrate in circulation to melanin.

REPORT OF A CASE

Selvarani, a girl aged 12 years, resident of Ceylon enjoyed good health till she was 3 years old. Her father first noticed her inability to face day light. Later he noticed the scattered pigmentation over the exposed parts of the body.

Six months ago a growth appeared on the inner canthus of the left eye, and gradually spread over the sclera. She was breught from Ceylon to the Government Ophthalmic Hospital, Madras, and the growth was removed on the 6th September 1947.

From there she was sent to the Skin Department of the Government General Hospital, Madras for her skin condition.

Sections of the skin were sent by the Medical Officer-in-charge, for histological investigations to the Pathology Department.

When she was stripped and examined, dark pigmented spots resembling freckles were seen throughout the exposed parts of the body intermingled, with depigmented whitish glistening spots. The pigmentation was most marked over the face, the nape of the neck and on the back where it extended in the form of a triangle with the apex over the 12th dorsal spine.

In front, over the chest, the spots of pigmentation extended down to the xiphisternum leaving the throat, axilla, and the sides of the chest free. Lower abdomen, mons, vulva, and gluteal region as well as the dorsum of the feet, soles and palms were free from pigmented spots.

The thighs and legs were free from abnormal pigmentation, but scattered diffusely over the surface were depigmented whitish glistening spots. The surface of the skin was slightly dry but smooth except on the face where a few small dark elevated moles were observed wherever the pigmentation was deep. It was noticed that those parts of the body which were covered by the patient's clothes were practically free from excessive pigmentation but here small whitish glistening spots of depigmentation were most numerous.

This girl's eldest brother who is 16 years old is normal and has healthy skin. Her second brother who is 14 years old has similar spots of pigmentation on the skin and uses tinted glasses in daylight.

The growth from the eye on histological examination proved to be an epithelioma with irregular atypical down growths of the rete cones made up of large abnormal squamous cells, surrounding concentrically arranged cells, showing parakeratosis with central horny pearls.

Histological studies of the skin were carried out in more detail.

Staining Methods Used

1. For routine staining Ehrlich's acid haemotoxylin and eosin.
2. For fibrous tissue, Van Gieson.
3. Weigert's elastic tissue stain.
4. For dopa reaction the technique of Laidlaw (1932) with slight modification was used with thin frozen section.
5. For control thin frozen sections stained with 0·5% safranin were used.

Histology of the Skin

The most noticeable abnormality in the epidermis was the great increase in the melanin pigment, which was not limited to the basal cell layer, but was found in successive layers above the basal cell layer involving even the stratum corneum. The normal Indian skin does not usually show melanin pigment in the cells above the basal cell layer, except in very dark individuals. This extensive pigmentation of the cells of the epidermis was localised to certain areas. Here groups of epidermal cells beneath the pigmented basal cell layer showed extensive proliferation, and bundles of these cells could be seen projecting deep into the dermis. These cells were devoid of melanin, but showed a strong dopa positive reaction, characteristic of melanoblasts when thin frozen sections were stained with dopa. In some areas these groups of melanoblasts were isolated from the basal cell layer, and occurred as islands in the subpapillary layer of the dermis. The arrangement of the melanoblasts in these groups were bizarre in their relation to each other, and to the cells of the basal cell layer (Fig. 4). These cells were characterized by their oval or dendritic shape, strong dopa reaction and absence of intercellular bridges (Fig. 5). Dawson (1925) in his studies on "The melanomata" found a proliferation of the deeper layers of the surface epithelium and rete pegs which later form cell nests, lose their prickles and become distinct from each other. Wherever these melanoblasts occurred in numbers, they were pressed out into elongated oval cells with a bulbous lower pole projecting into the dermis, and an upper pole showing dendritic intercellular pro-

LEGEND FOR FIGURES

Fig. 1—Photograph of patient Selvarani showing spots of pigmentation and depigmentation intermingled intimately.

Fig. 2—Photomicrograph of frozen section from a highly pigmented area of skin stained with dopa, showing the melanoblasts (A, A) stained deep black, projecting into the dermis.

Fig. 3—The same section of skin as in Fig. 2 cut in serial stained with safranin. The melanin pigment is seen in the basal cell layer of melanocytes (B) as little domes above the nuclei. Faint outlines of numerous melanoblasts (A) can be seen below the basal cell layer which are free from melanin pigment. Stratum corneum has taken a deep stain.

Fig. 4—Frozen section of skin stained with dopa shows islands of black staining melanoblasts (A, A) deep in the subpapillary layer of dermis.

Fig. 5—Photomicrograph of specimen as in 4 magnified four times to show the islands of melanoblasts and the bizarre arrangement of the cells.

Fig. 6—Frozen section of skin from a highly pigmented area stained with safranin shows pigment laden melanocytes in all the layers of the epidermis and accumulation of numerous pigment laden melanophores in the dermis.

Fig. 7—Section from the edge of a depigmented area shows scarcity of melanin pigment in the basal cell layer. Frozen section stained with safranin.

longations (Fig. 2). In those areas where the melanoblasts were less abundant, the shape of these cells as well as their arrangement in relation to the other cells of the basal layer vary. They were found either just beneath the pigmented basal layer, in between the cells of the basal layer, or in the layer of cells above the pigmented basal layer, an irregularity in the distribution of these cells which indicate an abnormality in their genesis. In those areas of the skin which appeared glistening white, melanoblasts, as well as melanocytes were absent or were scanty in the epidermis (Fig. 7).

There was moderate hyperkeratosis. In some areas there was narrowing and atrophy of the rete cones, whereas in other areas there was hyperpigmentation and a tendency for formation of broad irregular down growths of rete pegs.

Atrophic changes as mentioned by Councilman and Magrath (1909) quoted by Sutton (1927), were not present and the statement that the pigmentary process was secondary to an inflammatory change in the corium did not find support in the present study. There were small collections of round cells in the subpapillary layer of the dermis, but as most of these in the frozen section showed the presence of varying amount of melanin pigment in the cytoplasm they were undoubtedly chromophores which had collected in response to the excessive production of melanin by the melanoblasts (Fig. 6). It is presumed that the atrophy in the structure of the corium may occur later in the disease.

Discussion

How far hereditary influences play a part in this disease has not been determined, since almost all those children who are affected by this disease die before they reach adolescence. The small circumscribed areas of depigmentation in the covered portions of the body do not appear to indicate an insufficiency of the melaninforming mother substance in the body, but an absence of active melanoblasts in these areas. It is definitely known that

FIG. 1

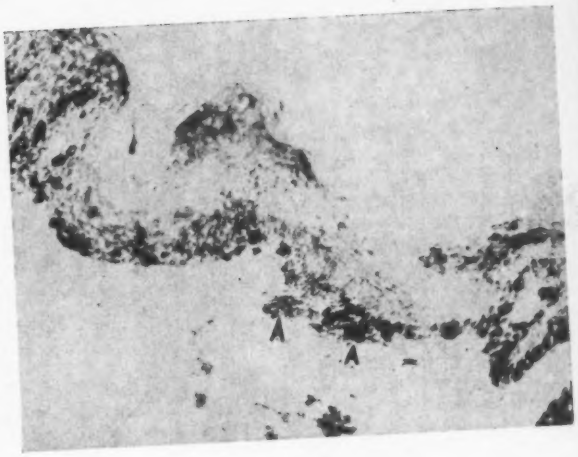
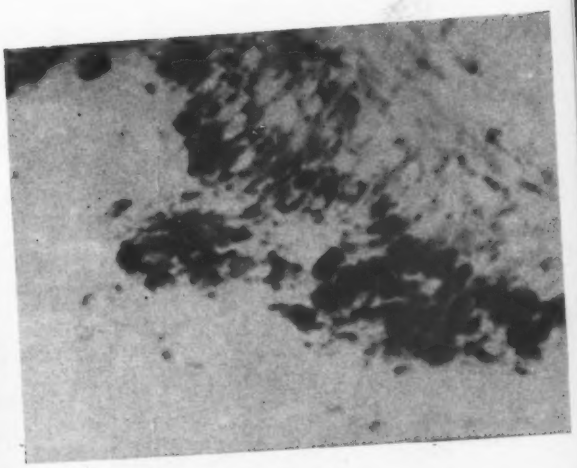


FIG. 2

FIG. 3



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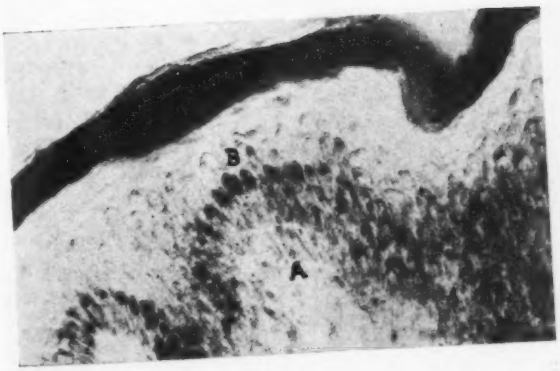
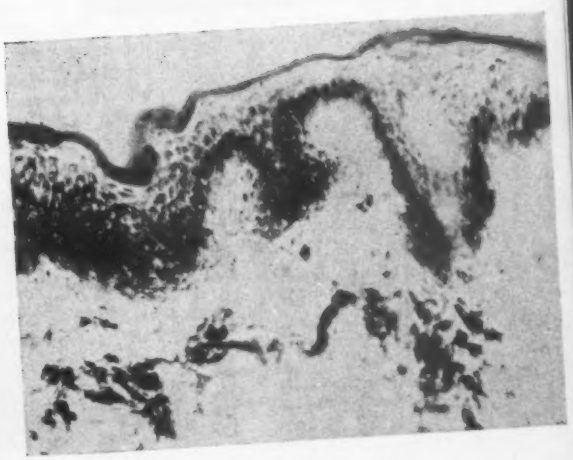


FIG. 5



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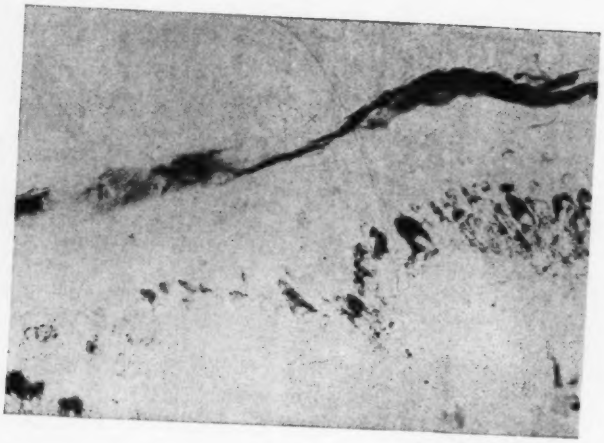

FIG. 7

SUNDARESON—*Xeroderma Pigmentosa with special reference to Dopa Reaction.*

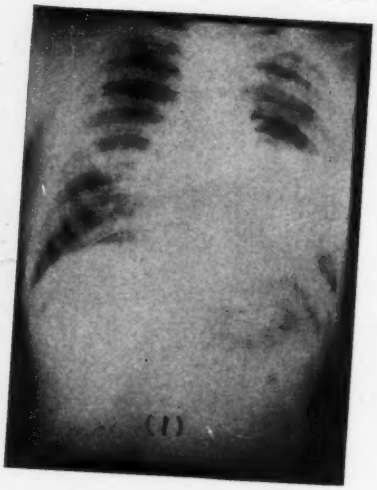

FIG. 1

FIG. 2

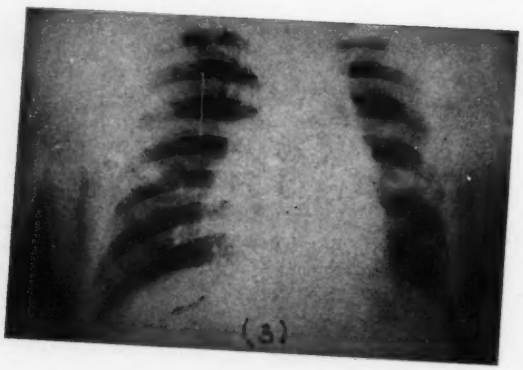

FIG. 3

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RASTOGI—*Lung Abscess with Pyopneumothorax.*

pigment patterns are determined by heredity. In this disease also the distribution of dopa positive cells seems to be determined by heredity; and the pattern of pigmentation follows the distribution of melanoblasts accurately; but the intensity of pigmentation is influenced by the stimulating effects of the sun's ultra-violet rays on the melanoblasts as shown by the increase of pigmentation on the exposed surface of the body. Laidlaw, (1932), found that the exposure of the skin to x-ray and ultra-violet rays increased the activity of the melanoblasts.

A study of the dopa reaction in this disease suggests that the melanogenesis in human skin is epidermal. Whatever may be the function of the melanin pigment in amphibians and reptiles in whom the melanoblasts occur in the mesodermal tissue of the skin as well as in the epidermis, in man its presence in the skin serves to protect the body against the actinic rays of the sun. Where the melanin pigment is not sufficient to exert this protective action, as in the case of white seamen and farmers who are constantly exposed to the action of the strong rays of the sun, there multiple cutaneous epitheliomas or basal cell carcinomas are likely to occur (Ewing, 1942).

The irregular distribution of the active melanoblasts in the upper layers of the stratum spinosum, the basal layer, and in the subpapillary layer of dermis just below the basal cell layer in xeroderma pigmentosa indicate a dermal instability which is characteristic of this disease. It is not surprising in this disease therefore that this instability should result in the formation of squamous cell carcinomas and malignant melanomas.

There appears to be an ill-directed attempt at protecting the body against the sun which has resulted in an abnormal proliferation of melanoblasts in some areas with absence in others. It is probable that the stimulation of the unevenly distributed hypersensitive melanoblasts by the ultra-violet rays of the sun is the essential pathogenesis of this disease.

Summary

Clinical report of a case of xeroderma pigmentosa with a description of the distribution of melanin pigment is given. Histological study of skin after dopa reaction showed an abnormal proliferation and distribution of the melanoblasts. The importance of heredity and the action of the ultraviolet rays of the sun in the production of this disease is discussed.

Acknowledgment

The author wishes to thank Lt. Col. J. Eapen the medical officer in charge of the dermatology department, Government General Hospital for the skin biopsies; Dr. Damodaran, Director, University Biochemistry Laboratories, Madras, for dopa, and Professor D. Govinda Reddy for his helpful criticism.

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DETERMINATION OF ATTACK ON FLAGELLA BY ABSORPTION OF CHOLERA PHAGE TYPES*

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In a previous communication (1939 & 1947) it was pointed out by the author that the A type cholera phage is fixed by the smooth specific polysaccharide containing the antigen of the cholera vibrio (Inaba or Ogawa) and the antigen is present in the body which determines the serological specificity. In the interim Bruce White (1936) showed that by fractioning the smooth somatic antigen of the cholera vibrio into fractions I & II, the A type phage was effectively fixed by fraction I of the cholera vibrio (Inaba, Ogawa). No other fractions of different serological types of vibrios fixed the type A. Various considerations led him to suggest the presence of a 'lipoid substance' in the cholera vibrio for the fixation of type phages B to J. While the types C,E,G, & H were fixed by the 'lipoid substance' the type D, was not fixed just as the type A, by the 'lipoid material'. The type B was irregular in its behaviour, sometimes it was active like the types A & D while at other times it was fixed by the 'lipoid material'. No fractions of a cholera vibrio fixed the type D. While the 'lipoid material' is concerned for the fixation of types C,E,G, & H, the types B & D are not inhibited by the substance particularly the type D. So far it could be gathered from the literature that the substances identified for the fixation of a phage are either a polysaccharide or a lipoid material. In the absence of direct proof, indirect conclusion may therefore be drawn that the substance concerned for the inhibition of type D is a polysaccharide. The irregular behaviour of the type B may be accounted if we take into consideration that the type B makes its attack on two substances one polysaccharide and the other lipoid substance (1936).

Baltaenu (1926) showed that the cholera vibrio possesses a double receptor; one heat-stable somatic antigen and the other heat-labile flagellar antigen. He separated the flagellar antigen from the body by shaking and centrifugation and was able to prove that the supernatant fluid contained the flagellar antigen. Craigie (1931) later on showed that by shaking and centrifugation, the flagellar antigen was liable to be denatured and with a view to prevent from denaturation he suggested the fixation of the organism by formalin and capryl alcohol so as to prevent the formation of foam during shaking. Similar methods were adopted here with a view to prepare a suspension rich in flagella.

Since the flagellar antigen of a rough cholera vibrio is assumed to be the same as that of a smooth cholera vibrio, the preparation of the flagellar suspension was made from rough cholera vibrios or from rough vibrios which are supposed to have

*The materials for this paper were collected by the writer when he was attached to the Pasteur Institute and Medical Research Institute, Shillong.

common flagellar antigens.† The utility of this selection was mainly two-fold. The smooth somatic antigen was entirely eliminated from the flagellar suspension. The rough vibrios are salt-sensitive and this phenomenon was very useful in throwing down the bodies of vibrios completely to the bottom keeping the supernatant fluid almost clear.

Preparation of the material—24 hours' growth from two Roux flasks was washed in about 10 c. cm. of 0·2 per cent formol normal saline per flask and allowed to keep at room temperature overnight. The washings were lightly centrifuged for about an hour in an electric centrifuge. The supernatant was thrown away and the deposit was suspended in about thirty to forty c. cm. of normal saline to which about one or two drops of capryl alcohol was added. The suspension was then shaken in a sterile flask containing glass beads for about one hour by hand. It was next centrifuged for three hours. The supernatant fluid was pipetted off in sterile tubes and kept in the refrigerator overnight. Next morning it was again centrifuged for six hours and the supernatant was separated. The suspension was slightly opalescent and was stained for flagella by Plimmer and Pain's method (1921). It was also used for an agglutination test against H and O serum. By both these tests, as a method of check the suspension was found mainly, composed of flagella. As the flagellar antigen is labile, any treatment for the digestion of suspension with papain in an acid medium may upset the mechanism of phage absorption, it was decided to heat it at 56° C. only for half an hour. The heated flagellar suspension was used for phage absorption.

Technique

Stock dilutions of phage types B to K were kept after titration of each type. For the absorption experiment the technique used by Scholten (1937) as suggested by Gratia was employed. One c.c. of the flagellar suspension was mixed with one c.c. of stock dilutions, generally between 10^{-3} and 10^{-5} of the types B to K in sterile tubes and kept in the refrigerator overnight. Controls were also put with papain broth pH 7·6. For testing the residual phage the removal of the flagellar suspension with absorbed bacteriophage corpuscles by centrifugation was not necessary, because Kimura (1935) stated that heatkilled organisms absorb phage and the reaction is irreversible. The residual phage was tested by counting the plaques as compared with the control. 5 c.c. of 1·5 per cent agar in tubes was melted and the temperature brought down to 40°-45° C. To the agar tubes 1c.c. of the mixture to which 3 c.c. of a 18-24 hours broth culture of a cholera strain sensitive to all types were mixed and thoroughly shaken. Controls were also similarly treated. The mixtures were then poured into half division plates 10 centimetre in diameter; one quadrant for the mixture, the other for the control. On incubation the plates revealed as shown in Table 1 and Figs. 1, 2, 3, 4, 5 and 6.

Table 1

Types of Cholera-Phage	*Flagellar Suspensions*				
	Inaba R	Entally 79- R	N. 32/77- R	N. 32/110- R	N. 32/101 R
B	++++	+++	++	+++	+++
C	−	−	−	−	−
D	++++	++++	+++	−	−
E	++++	++++	−	+++	−
F	++++	+++	−	+++	−
G	−	+++	−	−	−
H	++++	+++	−	−	+++
J	+++	+++	−	−	−
K	+++	+++	−	++	−

Note :— ++++ denotes almost complete absorption.
+++ „ 75 per cent absorption.
++ „ 60 per cent absorption.
\+ „ 50 per cent absorption.
− „ No absorption.

Fig. 1

From Table I and Figs. 1, 2, 3, 4, 5 and 6 it will be seen, that besides the types B & D, other types are also absorbed by the flagellar suspension. The type C is not absorbed by the flagellar suspension. Following Bruce White, type C is fixed by 'lipoid substance' but the heated flagellar suspensions do not absorb it. In other words the mechanism of absorption (1937) for the type C is absent in the flagella of vibrio having a common flagellar antigen. Similarly, the type D which was not fixed by lipoid material may be assumed to be absorbed by a polysaccharide receptor in which probably the mechanism of absorption is present (*loc. cit.*). While lysis by

†Since the writing and publication of this paper, Bruce White (1940) devised a new method of preparing flagellar suspension. The rough cholera vibrios were selected as in this paper by Bruce White probably under similar considerations.

D would determine a common flagellar antigen with that of a true cholera vibrio, the strains N. 32/110-R and N. 32/101-R do not absorb it and still they are

FIG. 2

H agglutinator. It appears from this that besides the receptor for D, there are other subsidiary receptors, common with that of a true cholera vibrio, which make them H agglutinator. One of the

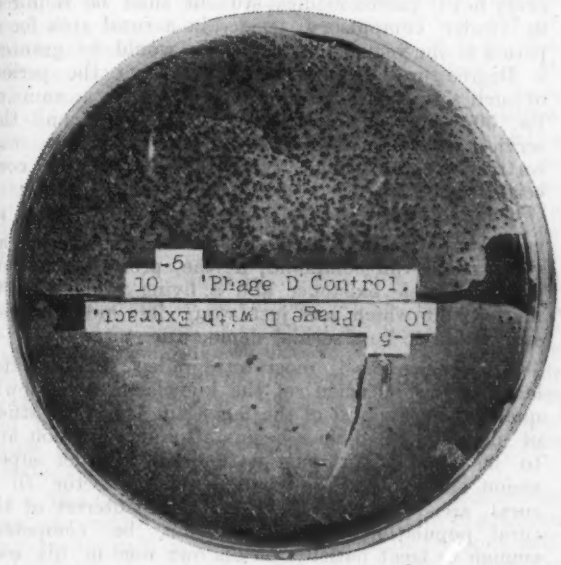

FIG. 3

receptors, may possibly be for the type B. But there are vibrios which inspite of being neither B lysable nor absorbing the type are still H agglutinator. This raises the question that besides the receptors for types B and D, there are type or types for the subsidiary receptors common with a flagellar antigen of a cholera vibrio.

FIG. 4

SUMMARY

Experiments are devised in a way as to show that certain types of cholera phage attack on the flagella of vibrios.

FIG. 5

CONCLUSIONS

(1) The receptor for the type D is probably a polysaccharide. The type B makes its attack on two substances one lipoid and other polysaccha-

ride in which probably the mechanism of absorption is present. The receptors for both these types B & D are probably located in the flagella of cholera vibrio.

FIG. 6

(2) Flagellar antigen is more complex than the smooth somatic antigen, with subsidiary active centres and when one or other is absent a group of receptor or receptors determines the flagellar agglutinogen.*

*The title of the paper is not clear and conclusion No. 1 is unwarranted and not borne out by experimental evidences. What the author really wants to show is that vibrio flagellar suspension like the O-suspension can absorb certain phage types. No clear-cut proofs have been brought forward to show that the author's flagellar suspension is a pure reagent and nothing but flagellar material alone. The author ought to have shown that his suspension is agglutinated by a rough (HO) serum and not so by a pure smooth O serum and that the suspension injected into a rabbit will give rise to flagellar agglutinins only and no O-agglutinin. The author should also put up experiments with A phage as well and when testing with phages, at least phages of each type from two different sources should be used. It appears from the paper that the author has used the phage types from one single source only, although he has rightly used flagellar suspensions from 5 different sources. Phages ought to have been put up with the rough O-suspensions also as a control against the H suspensions. The author should repeat the experiment of preparation of flagellar suspension and prove beyond all doubts that his reagent is pure. He should also carry out experiments along the above lines.—EDITOR, *J. Indian M. A.*

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RURAL MEDICAL RELIEF

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It is admitted at all hands that there is no other civilised country in which the provision for proper medical relief in rural areas is as poor as in India. But why is it so? The newly-come-into-power politician-administrators, responsible ministers and social and public workers are blaming the medical profession for it. For some time they have been saying, on all possible occasions and from all platforms, that doctors refuse to go to villages and take to rural practice. But they never tried to find out the reasons for it and that is why the solutions they have been proposing are not hitting the target. If only they and our popular governments will take the Indian Medical Association—which is the only organization which represents all sections of the medical profession in India—into their confidence and consult it, it will tell them why qualified medical men hesitate to go to the villages and what can be done to pursuade them to go there.

In the issue of the *Journal of the Indian Medical Association* for December, 1947, the editorial contained the following words :

> "There are rumours afloat that schemes are being formulated to force the doctors to serve in the villages".

One instance of a scheme of that nature has recently come to my notice. A certain Provincial Government is considering a proposal whereby every newly passed medical student shall be required to render compulsory service in a rural area for a period of one year before he or she would be granted a Degree or Diploma and that during the period of such service he or she will be granted a sum of Rs. .50/- P.M. as out of pocket expenses and the service will be considered as approved if it was certified by the Civil Surgeon of the district concerned as such.

This is a most dangerous move which must be combated by the profession in time, and with all the force it can command, if the profession wants an honourable existence and a living wage in its motherland which has just won its independence and is said to be a secular democratic state.

The proposal is most retrograde. It indicates lack of appreciation of the knowledge of a newly qualified doctor and of the fact that the real study of practical medicine begins after qualification and to be effective it must be undergone under supervision and guidance. To send a raw doctor to a rural area would neither be in the interest of the rural population for he will not be competent enough to treat patients on his own nor in his own interest for who would give him the necessary post-graduate instruction so essential for him at that stage? Surely not the village attar (indigenous chemist) or barber or mystery man! His forced employment in a village at that stage of his training will make him forget the little he had learnt as a

student and will jeopardise the lives of those he would be called upon to treat without guidance.

One of the first laws of learning and of doing a thing successfully is to develop interest in it. But can one ever be interested in a thing that is forced on him much against his will? To believe that one can be so interested is to ignore human nature. Will the conscript—leave aside his competence or otherwise—take genuine interest in his patients or will he just try to secure by hook or crook, a certificate of approval from his civil surgeon who will not be likely to inspect his village dispensary more than once during the year and that too for not more than a few minutes? Having secured that certificate of approval he will make room for the next conscript and the process will go on *ad infinitum* without giving the poor villager the relief he needs.

A Civil Surgeon is still behind by our popular ministers, who ought to know better, to be the final authority—a specialist—in all the many branches of the medical service while in reality he with a few exceptions, is more of a specialist in medico-legal work than in anything else. To place a newly passed medical student in a village all on his own and at the mercy of the Civil Surgeon of his district at a time when he should be receiving post-graduate training under proper supervision and guidance would be very wrong indeed.

And may it be asked why the medical profession alone is being singled out for conscription? If it is necessary to improve the medical conditions in rural areas is it not equally necessary to improve facilities for education or for veterinary aid or for legal assistance or the streets, roads if any, the drains and buildings etc.? Why there is it not proposed to conscript all those who would pass the matriculation or the intermediate or the degree examinations, or the various educational training examinations, or the veterinary examinations, or the law examinations, or the engineering examinations? And why not conscript all prospective M.L.A.'s and Hon'ble Ministers for social service so badly needed in rural areas? While all else are expected to be adequately paid for the services they render and to be entitled to all the amenities of life the poor doctor is denied all this on the plea that his is the noblest profession of all and that he must serve the ailing humanity at the cost of his personal conveniences and the barest necessities of life for himself, his wife and children. The sooner this one-sided view is given up the better for the state, the society and the profession.

The need of giving every newly qualified doctor an opportunity to receive post-graduate instruction so as to gain sound practical training and self-confidence is felt all over the country. But the proper place for such training is a teaching hospital or any other hospital recognised for the purpose and most certainly not a village dispensary manned by the raw doctor himself. This would mean the up-grading and modernising of at least all the district headquarters hospitals which at present are in a very backward condition almost all over the Union. The period of such post-graduate training in a home appointment is generally admitted to be at least one year. If after that he is required to put in one year conscription in a rural area as proposed he would have spent at least 9 years after matriculation to get his degree or diploma provided he passed all examinations at first attempt—a feat not within the reach of many a medical student. Is this desirable and is it necessary, fair and just? No, undoubtedly not. And what emolument will he get after such incredibly long and costly training? The Provincial Government referred to above is, according to my information, about to propose a very generous scale of Rs: 120/- P.M. It is earnestly hoped that that information is incorrect, but if there is any truth in it the profession must be prepared for the worst.

To the minds of those who have given the problem a serious thought the solution is entirely different. Every newly recruited medical officer must first be employed in a rural area for a certain number of years before he is posted to a Tehsil dispensary of Thana dispensary or Sub-divisional dispensary or District head-quarters hospital or any other such hospital. The cadre of medical officers—Provincial and Local Bodies—should be increased to meet the requirements of each province. The extra cost involved therein should be met by raising the Medical and Public Health budget allotment to the extent of 15% of the total revenues as recommended by the Bhore Committee. If further economy was needed the services of suitably qualified independent practitioners may be utilised in the towns on an honorary basis in addition to or in place of some of the salaried officers as required. Further, these doctors who belong to rural areas or by familial, enviromental or geographical associations are inclined to settle in or are likely to be attracted by rural areas should be encouraged to do so. No scheme based on conscription or compulsion of any kind will ever work. It will defeat the very object for which it will be formulated and will alienate the sympathies of the entire medical profession. All Governments in the country should make a genuine effort to find out from the profession why rural areas are not attracting medical men, remove those factors which are keeping them away, and offer them reasonable terms. If then they will not respond to the call of duty in rural areas measures of compulsion may be thought of and enforced.

Inflation, taxation and rise of living index have changed the state of affairs. Professional classes are fighting to retain old standards and denied advantages enjoyed by many business men and wage-earners. The doctor's training is long, his life arduous and short and his responsibility great both to his patients and to his family. He has a particular claim to a good environment for his personal life, for his wife and for his children. The social importance of paying him well must not be over-looked. If the monetary value of his services were set too low in relation to those of the professions the standard of medical relief would suffer. If

a doctor is given a living wage, the necessary amenities of life and facilities for the education of his children he will gladly take to village practice and will take personal interest in his patients and enter into their joys and sorrows. If he is denied all this and is sent to rural areas under compulsion of any form the result will be disastrous and he, the rural population, the medical profession and the state will all suffer.

QUEST OF A TRANSFUSION AGENT

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When I was working in the U. P. Provincial Blood Bank in the year 1942, it struck our Director, Dr. A. Hameed, M.D., M.R.C.P., that the response of the Indian blood donors was never sufficient to meet the demands of serum, the yield of which on an average is 25% of the whole blood collected and that some of the transudates from the patient of endemic ascites may be used for the same purpose as this contains both proteins and chlorides especially in cases which require large amounts of fluid, *e.g.* in cholera. This experiment was tried in other parts of the country and the world, so I set forth to test the chemical composition and toxicity of this fluid.

Materials for Experiment

Fluid from the abdomen of cases of endemic ascites was collected and filtered by Seitz filter under aseptic conditions both with and without previous treatment with animal charcoal for 24 hours.

Chemical Analysis

Before filtration (*Average of* 100 *cases*)

Total protein	..	0·6 gm%
Albumin	..	0·3 gm%
Globulin	..	0·3 gm%
Chlorides	..	100 mgm%

After filtration (*Average of* 23 *cases*)

	After previous treatment with charcoal.	Only after filtration.
Total protein ..	0·35 gm.%	0·45 gm.%
Albumin ..	0·3 gm.%	0·3 gm.%
Globulin ..	0·05 gm.%	0·15 gm.%
Chloride ..	630 mgm.%	695 mgm.%

Results

Complement value of stored ascitic fluid was determined and was found to be nil.

Twenty three cases were given I. V. ascitic fluid after filtration and culture tests as for serum.

First I started with 5 c.c. I.M. ; then the same amount I.V., then up to 25 c.c. This gave rise to no special reaction. Six cases were administered with one pint each of ascitic fluid after filtration only which gave rise to a more severe reaction in the way of rigor and temperature. One of the patients developed jaundice. Then I used ascitic fluid only after incubation for 24 hours with animal charcoal. The fluid was not toxic in any other way except that it gave rise to rigor, headache and rise of temperature from 100° F to 103° F which settled down by the evening.

Of particular interest was a case of spastic paraplegia of unknown etiology who was given these injections and with every pint administered each time he had a rigor and his paraplegia improved so much so that he used to beg of me to give him further injections. I gave him three pints at an interval of four days and he showed a marked improvement in his paraplegic condition (non specific response).

This fluid was also administered in a few cases of chronic diarrhoea in the last stages with not much response. I had no opportunity of trying this in acute cases.

Further work in the clinical side is necessary to either accept or discard this fluid which contains human proteins and sodium chloride in low concentrations to be of any value as an infusion fluid.

TREATMENT OF BACILLARY DYSENTERY WITH SPECIAL REFERENCE TO CHEMOTHERAPY*

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Bacillary dysentery, an acute infectious disease caused by *Shigella dysenteriae* of various strains, in often characterised by sudden onset, passage of frequent stools containing blood and mucus accompanied by abdominal pain and tenesmus.

It generally occurs in an endemic form in Bombay, but, it may break out in epidemic form in the presence, of overcrowding, bad sanitation, privation and other causes as it did in Children's Home at Chemubur about five years ago.

Adults between 20 and 30 years of age and children under 5 years of age are most susceptible.

Insects like flies, ants and cockroaches that have an access to food material, human carriers and contaminated food and water, are the common means of spread of the disease in which respect it closely resembles enteric fevers. Seasonal distribution and undulation in its incidence-curve, corresponds well with fly curve rather than the temperature.

Various strains of dysentery bacilli have been classified and described. "While such detailed studies are of interest especially to bacteriologists, the results to the clinician must be to some extent confusing and moreover they have not been uniform". Col. J. S. K. Boyd, Director of Pathology, Middle East Forces, in a recent report, points out that they have given up examining stools of dysentery cases bacteriologically, as they have now all information they want as to its incidence,

*Read at the Scientific Session of XXIV All-India Medical Conference, Bombay, December 1947

and it does not help the clinician in any way to know what particular organism is responsible in most cases. He believes all the necessary information can be obtained from microscopic examination (Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases by Strong, 1944). As the patients suffering from this disease are generally admitted in the City Fever Hospitals in very acute and advanced stages associated with dehydration, toxaemia with or without collapse or fever, requiring immediate specific and supporting measures, I have also not found it essential to insist on bacteriological diagnosis of all the cases dealt with from the treatment point of view. The clinical diagnosis is confirmed by microscopic examination of the stools early in the disease. The fresh mucopurulent stools are alkaline in reaction, very cellular and contain pus cells as well as columnar epithelial cells and macrophages; the R.B.C.'s are discrete and not clumped.

In practice, for the purpose of bacteriological diagnosis wherever necessary, it is sufficiently satisfactory to separate the important dysentery bacilli into 2 main types which are as follows :—

(1) Shigella dysenteriae (Shiga-Kruse type) which produces no acid in mannite media and does not form indol.

(2) Shigella para-dysenteriae (B.Flexneri, Hiss Y, Strong, Boyd and others) which produces acid in mannite media and forms indol.

Shiga type is homogenous in its antigen content and may be differentiated from other types serologically although there is some group agglutination with other types. Agglutination tests (serological diagnosis) are not dependable because : (a) agglutinins are not invariably present during or after an attack of dysentery ; (*b*) they become positive from 1st to 3rd week ; (*c*) normal sera may give positive test ; (*d*) presence of diagnostic titre does not necessarily indicate active bacillary dysentery (previous attack), nor does its absence rule out the disease.

Clinical attack caused by these organisms varies from mild form associated with mild diarrhoea, passage of blood and mucus without toxaemia or fever, to that of a very severe and acute type associated with marked frequency of stools with blood and mucus, severe dehydration, toxaemia and collapse which may simulate cholera but for the characteristic stools. Though severe toxaemic forms are generally caused by Shiga organisms, and milder varieties by the other types of organisms, there is no absolute co-relation between the type of positive organisms and the clinical picture of the disease as was observed from bacteriological investigation of all the unselected 5 cases amongst three of whom Shiga B. dysenteriae was detected and in the remaining two B. Flexner was detected in one and B. dysenteriae Strong in the other. One of the three Shiga cases had fever and toxaemia of the same degree of the severity as was noticed in the case of Flexner and Strong types.

The incubation period varies from 2 to 7 days.

Mortality varies widely with the locality and particular outbreak from 2 to 80% Prognosis varies with the severity of the epidemic, age, general condition of the patient and presence or absence of complications. Prognosis is bad when intestinal symptoms are very severe and persistent and collapse has resulted. Death is caused by toxaemia and circulatory failure or, later, by peritonitis or inanition or intercurrent complications such as pneumonia.

Treatment

The main principles of treatment in bacillary dysentery are :—

(A) Adoption of General Measures—(1) *To conserve the energy of patient by rest, and relief of pain.* Absolute rest in bed and facilities to pass stools and urine in recumbent position etc. should be provided to protect the heart which tends to be more or less damaged by toxins.

(2) *To ensure rest to bowels*—In this connection the old fashioned procedure of administration of castor oil or sodium sulphate as purgative to eliminate toxins has been found to be not only unnecessary but harmful, and in the acute dehydrated and collapsed cases or acute cases with extensive ulceration of the bowels definitely contraindicated. With the present method of therapy i.e., chemotherapy it interferes with the beneficial response to treatment and as in the case of cerebrospinal drainage by lumbar punctures of cases in cerebrospinal fevers, intestinal drainage by purgative of any kind is now outmoded and hence discontinued in the treatment of bacillary dysentery by chemotherapy.

On the other hand, I have found even in the prechemotherapeutic days that astringent drugs as bismuth and kaolin preparations administered orally and rectally, afford prompt response to chemotherapy. Animal charcoal preparations also help to relieve distention and discomfort and reduce the number of stools when given along with astringents.

(3) *To maintain nutrition*—(1) Nutrition is maintained by administration of bland fluid diet such as apple-juice, banana pulp paste, whey, albumin water or barley water sweetened with lactose and conjees etc. This is preferred to milk which is not well borne. (2) When acute symptoms have subsided, jellies, sago pudding, and citrated milk may be given. (3) When mucus and blood have disappeared, half-boiled egg, custard, milk pudding, toast and butter may be administered. Vitamins like ascorbic acid and thiamin hydrochloride, may be also given if there is evidence of their deficiency. Jajjar and Holt have demonstrated inhibition of bio-synthesis of thiamine during sulphonamide therapy and hence administration of large doses of thiamine might be advisable when sulphonomides are employed.

(B) Treatment of Symptoms and Signs—The important indications for prompt and energetic

treatment are dehydration, disturbed biochemical equilibrium, toxaemia and symptoms of shock or circulatory failure, as seen not infrequently in severe acute bacillary dysentery.

(1) *Correction of dehydration and maintaining of biochemical equilibrium*—It is necessary to substitute loss of fluids and salt-contents in these cases and to prevent or correct acidosis caused thereby maintaining the alkalinity of blood as in the corresponding circumstances in cholera patients. In severe cases, Roger's hypertonic saline with or without alkaline solutions are to be injected intravenously and repeated if required in quantities as indicated by the blood pressure readings, urinary response as regards quantity, and general condition of the patient. Hypertonic solutions of glucose and calcium gluconate (10% 10 c.c.) may also be given intravenously.If the response is not prompt or it is not maintained inspite of repeated infusions of hypertonic salines, glucose, alkaline solutions etc. relief is obtained by infusions of blood plasma as in similar conditions met with in cholera.

(2) *Treatment of Toxaemia*—In most instances it can be controlled by specific therapy and prevention or correction of dehydration by adequate administration of fluids and maintenance of nutrition. Fluids must be given in sufficient quantities to ensure that adults pass a litre of urine in 24 hours; if necessary, oral intake may be supplemented by subcutaneous or preferably intravenous infusions of glucose-saline. In hyperpyrexial cases hydro-therapy is indicated.

(3) *Symptoms of shock and circulatory failure*—These are treated by injections of atropine sulphate, circulatory stimulants such as coramine, and injection of adrenal cortical extract etc. repeated in doses according to the response or indications.

In very severe cases of dehydration with toxaemia and circulatory failure accompanied by oliguria or anuria, it would be necessary, besides attending to relief of dehydration, toxaemia and shock, to enforce urination by injection of 2% solution of potassium citrate or 1·5% sodium sulphate intravenously in 20 to 25 c.c. doses repeated at from 6-hourly to 12-hourly intervals; if required, injections of hypertonic saline, glucose and alkaline solutions intravenously, caffeine soda benzoas 7 grains intramuscularly, fomentations or cupping of the loins or even injection of mercurial diuretics may be required.

As soon as the emergency treatment is prescribed and adminstered, other symptoms may be to secure relief from pain, tenesmus, restlessness etc.

Antispasmodic drugs like preparations of hyoscyamus, starch-opium enemata occasionally or in severe distressed cases, even injections of hyoscine hydrobromide or morphine hydrochloride is necessary. Generally, in moderately severe cases local fomentations of turpentine stupes over the abdomen with hyoscyamus and carminative mixture, and occasional use of starch opium enemata, if urgently required, will suffice.

Vomiting and hiccough may be treated with chloretone, atropine sulphate and fomentations on the abdomen.

SPECIFIC THERAPY: (1) *Vaccines* in treatment of acute dysentery have not been reported to be useful.

(2) *Bacteriophage*—For some time, bacteriophage held the field but when results were compared with controls it has been found to be valueless. Riding (1930), Taylor (1930) and Kessal and Rose (1933), Strong (1944), Boyd and Portnoy (1944) who carried out controlled study of its efficacy on axis prisoners found no prophylactic effects of bacteriophage in the prevention of the disease or in moderation of the disease. It was concluded that bacteriophage fails to exercise *in vivo* the potent property which it exhibits *in vitro*.

(3) *Viable antagonistic organism*—Therapeutic implantation of viable antigonistic B coli strains in prevention and treatment of acute bacillary dysentery has not been thoroughly tested.

(4) *Serum*—Dysentery anti-toxin has been employed for 40 years, but, there is no universal agreement as to the exact benefit derived from it in the treatment of dysentery. I have given up its use after personal satisfaction that it is not reliably beneficial. Strong finds by his own experience, that mild cases do not require it while the most serious cases succumbed inspite of it. Tabbot (1936) does not also regard serum treatment as efficient in children. It is, therefore, extremely unlikely that serotherapy will hold any place at all in competition with chemotherapy. I have found by controlled studies of treatment of B. dysenteriae cases at the City Fever Hospitals, Bombay, by serotherapy as compared with chemotherapy, that with the help of the latter, whereas the cost of treatment is considerably lowered the average stay of the patient is reduced to 1/3, mortality to less than 3/4, frequency of stools to 1/2, improvement in general condition to within 1/4th period and relief from or cure of the disease 1/2 the period required by serotherapy.

Table I shows the comparative results with serum and chemotherapy.

TABLE I—SHOWING THE COMPARATIVE RESULTS WITH SERUM AND CHEMOTHERAPY

	Serotherapy	*Chemotherapy*
1. Effect on stools	7 Days.	3 Days.
2. Fever checked	5 „	3 „
3. Toxaemia checked	7 „	3 „
4. Dehydration relieved	9 „	4 „
5. Average stay in the hospital	12 „	4 „
6. Period for clinical cure	7 „	4 „
7. Mortality rate	20%	13%

(5) *Chemotherapy*—(*a*) Sulphonamides—All sulphonamides with the exception of sulphanilamide are effective in the treatment of bacillary dysentery in causing a rapid fall in temperature, prompt reduction of toxaemia and decided clinical improvement within 24 to 48 hours of chemotherapy. There is early reduction in the frequency of stools, their quantity

and change in character and contents i.e. blood, pus cells and mucus.

(*b*) The drugs of choice and recommended doses are shown in Table II

TABLE II—SHOWING THE SULPHA DRUGS OF CHOICE AND THEIR DOSAGE

Name of the drug	*Initial dose in gm.*	*Maintenance dose in gm.*	*Interval period*	*Period of treatment*
Sulphadiazine ..	2	1	4 to 6 hourly	4 to 6 days.
Sulphathiazole ..	2	1	„	„
Sulphapyridine ..	2	1	„	„
Sulphasuxidine ..	5	2·5	„	5 to 7 days.
Sulphaguanidine ..	5	2·5	„	„
Phthalyl Sulphathiazole (Sulphathalidine or Thalistatin).	3	1·5	„	„

(*c*) In the early days, it was thought, particularly, by Marshal and his co-workers (1940), that best results from the bowel and which have low concentration in blood and, hence sulphaguanidine was being used as the specific drug in this disease, in preference to absorbable drugs, like sulphaguanidine, sulphadiazine and sulphathiazole. But, later it was found that sulphaguanidine was erratically absorbed and blood concentration of the drug reached as high as ten to sixteen mgm. per cent, as reported by Kirsner, Rodaniche and Palmer (1943) and Smyth and others (1943). Its conjugated form is insoluble in urine and it has at times given rise to urinary tract disturbances. As regards the other less absorbable drugs like succynil-sulphathiazole (sulphasuxidine) etc. Kirby and Rantz (1942) have stated that their effectiveness is due entirely to hydroplysis in the gastrointestinal tracts with liberation of sulphathiazole.

(*d*) Hardy and Watt (1944) found earlier response to sulphadiazine and other well absorbed sulphonamides than to those which are poorly absorbed.

(*e*) Ching and Curris found that with absorable drugs in doses of 2 gm. initial dose followed by maintenance dose of 1 gm. every 3 to 4 hours, the blood level varies from a trace to 8·5 mgm% and that there was no relationship between the concentration in blood and its clinical effectiveness.

(*f*) Eisenoff and Goldstein (1943) who used sulphaguanidine, succynil-sulphathiazole (sulphasuxidine), sulphathiazole and sulphadiazine felt that no advantage could be claimed for one drug over any of the others.

(*g*) It has been reported by Poth and Knotts (1942) when experimenting with sulphasuxidine (succynil-sulphathiazole) on animals and human beings, that severe watery diarrhoea interferes with the action of the drug and judicious use of opiates help to obtain maximal bacteriostatic action of the drug.

(*h*) At the City Fever Hospitals, Bombay, and in New York State Institutions, sulphadiazine is the drug of choce.

(*i*) I found in 1943-44 that sulphapyridine was more effective than sulphaguanidine. In that year, I gave trial to sulphapyridine by rectal route and found that it was more effective than by oral route. In the years 1944 to 1946, I used sulphadiazine by oral route and it was noticeable that this drug was more potent and less toxic than sulphapyridine. The results are given in Table III.

TABLE III—SHOWING THE COMPARATIVE EFFECTS OF SULPHAPYRIDINE AND SULPHADIAZINE

	Sulphapyridine	*Sulphadiazine*
1. Total amount of the drug per patient required for complete cure	12 gms.	12½ gms.
2. Average stay of the patient in the hospital	6 days	5 days.
3. Mortality rate (per cent) ..	16·0	14·0
4. Diarrhoea checked	4 days	4 days
5. General condition improved ..	Third day	Third day
6. Cured	Sixth day	Fifth day

(*j*) During the year 1946-47, controlled studies were made of treatment of bacillary dysentery cases, with sulphadiazine by oral and rectal routes. 50 typical cases of bacillary dysentery were treated with the latter method, where 3 gms. of sulphadiazine tablets, crushed and suspended with 6 oz. of 50% kaolin emulsion was injected as rectal enemata, after preliminary bowel wash with Condy's solution (1 : 1000), an hour prior to the treatment. The drug was allowed to gravitate through a thick rectal tube, with the patient lying on his left side, and foot of the bed raised. This method discovered by me has been found to be very economic, wellborne by the patients, and easily carried out by attendants as it is to be repeated at 24 hours intervals. Table IV shows the comparative results of oral and new rectal method of administration.

TABLE IV—SHOWING THE COMPARATIVE EFFECTS OF SULPHADIAZINE BY ORAL AND NEW RECTAL METHOD

	Sulphadiazine by oral method	by new rectal method
1. Total amount of the drug per patient for complete cure ..	12½ gms.	5½ gms
2. Average stay of patient in the hospital	5 days	4 days
3. Mortality rate (per cent) ..	14	14
4. Diarrhoea checked	4th day	3rd day
5. General condition improved ..	3rd day	2nd day
6. Cured	5th day	4th day
7. Cost of the drug per patient	Rs. 1-6-0	Rs. 0-9-6

(*k*) Similar trial was given to Thalistatin (phthalyl-sulphathiazole) by oral and rectal routes, but as the quantity of the drug placed at my disposal for its trial was not sufficient to obtain correct and definite results of their use, results of their trial could not be said to be final.

Conclusions

It will be observed from the above experience of mine, as well as that of other authors, with regard to therapeutic efficacy of different kinds of sulpha-drugs in the treatment of bacillary dysentery that sulphadiazine is the drug of choice. Its rectal method of administration as advocated by me and practised with success at the City Fever Hospitals, Bombay, costs comparatively little and is within the reach of poor and middle class population on whom the brunt of the disease falls. It is also less toxic and is responded to with quick improvement in general condition, prompt reduction of toxaemia and diminution in the frequency of stools with change in character to normal within 24 to 48 hours after commencement of the therapy; the mortality is also low. I, therefore, would recommend the rectal method to the general practitioners as being the most convenient and economical for patients. It may, however, be noted that when any of the sulpha drugs do not show marked response to treatment, as indicated by reduction of symptoms like toxaemia and frequency of stools within 24 to 48 hours, the drug under trial should be replaced by another potent drug or the routes of administration may be combined with advantage for, I have noticed that in case, where in very severe cases, the response to sulphatherapy by either oral or rectal method is not satisfactory for a period of 3 days under observation, combined mode of treatment has changed the scale in favour of prompt recovery. Finally, in very acute cases with high fever, severe dehydration, toxaemia and collapse where every hour counts, combined oral and rectal mode of sulpha-therapy preferably with sulphadiazine should be instituted at once.

Summary

Acute bacillary dysentery requires prompt general measures and emergency symptomatic treatment along with specific therapy to help recovery of patients, who in the most severe variety of the disease, not infrequently met with, are prostrate with dehydration, toxaemia and collapse. Therefore, the patient must be treated according to the degree of dehydration, presence or absence of oliguria, acidosis, circulatory weakness and state of general condition, with administration of sufficient fluids either subcutaneously or intravenously, consisting of normal or hypertonic Roger's salines, alkaline solution, hypertonic glucose solutions, diuretics, and prompt measures like circulatory stimulants to prevent or treat circulatory failure as required. The specific therapy should be instituted at the same time preferably by rectal route adopting sulphadiazine as the drug of choice and in severe cases, both by oral and rectal routes. To obtain invariably prompt results, the general and specific treatment ought to be instituted as early as possible from the commencement of the acute illness.

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SPECIAL ARTICLE

URGENT NEED FOR IMPROVEMENT OF MEDICOLEGAL PRACTICE IN INDIA

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The honour and life of a person depend upon the declarations and conclusions of the medical practitioner who gives his opinion in medicolegal cases. The medical practitioner, by means of his scientific knowledge, arms or disarms the judicial power, unmasks the guilty, and clears the innocent. Such an important task requires special training, ability, clear judgment, wide knowledge, conscience and experience.

The most important application of the science of forensic medicine to the needs of the community is the proper conduct of a medicolegal autopsy. Its improper performance, and failure to understand the normal postmortem findings, and their misinterpretation, have frequently resulted in flagrant miscarriage of justice. There are no medicolegal institutes anywhere in our country where a thorough postmortem investigation can be done as in western countries, nor are there hardly any specialists in this field with a training in forensic pathology, taking up medicolegal work as a speciality. However, in most places especially in the mofussil, it is inadequately carried out by inexperienced medical practitioners who have not had any specialized training. The Bhore Committee has considered the problem and concluded that "the present position in regard to the investigation of medicolegal problems is very unsatisfactory."

Medical reform is in the air. Forensic medicine, as a specialized branch of medical science, has not kept pace with the progress made during recent years by the other specialities especially in our country. In view of the lack of interest exhibited by the medical profession in particular, and the law enforcing agencies in general, to promote the medicolegal practice in our country and especially when there is a desire to improve standards and quality of every branch of science, it is deemed appropriate to review briefly the subject of medicolegal practice of our country.

Medicolegal Systems Followed in India

Two systems are followed in our country, the police system and the coroners system. The police system is followed throughout the country except in the cities of Bombay and Calcutta where the coroner system prevails. The exact origin of the police system is not known, but most probably it appears to have been introduced after the advent of the British rule ; the coroner system has its origin in the early period of Anglo-Saxon civilisation.

The Police System—On receipt of information of an accidental or other unnatural death of any person, an officer, usually of the rank of a sub-inspector of police (or a head constable or a head of a village in certain provinces), informs the nearest magistrate of the same, and proceeds to the place of the incident. In the presence of two or more persons ('panchayatdars), who are generally the 'hangers-on' of the locality, the police officer holds an inquest and draws up a report of the apparent cause of death, which is signed by the investigating officer and the witnesses present at the inquest. In practice, however, the investigation officer usually would have suggested his own view of the matter and this in very many cases is accepted without dissent by the witnesses. In a case of suspected foul play or doubt regarding the cause of death, the investigating police officer forwards the body for postmortem examination to a qualified medical practitioner authorised to hold such examination, furnishing him with a requisition containing relevant particulars which happen to be usually meagre. The medical practitioner after conducting the autopsy issues certificates as to the probable cause of death to the concerned magistrate and the police.

The Coroner System—In the cities of Bombay and Calcutta, the coroner with the help of a jury holds inquests in cases of unnatural or suspicious deaths or in cases of deaths occurring in a jail within the jurisdiction of his court. The coroner is authorized by law to order a postmortem examination of a body to be made by any medical man, usually the police surgeon, whom he subsequently summons to his court to give evidence on oath. He then records evidence on behalf of the accused and then with the help of the jury finds a verdict as to the cause of death. If the verdict is one of foul play, then he issues a warrant for the arrest of the accused and sends him forthwith to the magistrate empowered to commit him for trial. When the perpetrator of the offence is not known the coroners jury returns an open verdict against some person or persons unknown, and the matter is held in abeyance, until further inquiry by the police throws more light on the perpetration of the crime.

Both the above systems as followed in our country are defective as the police officer and the 'panchayatdars' on the one hand, or the coroner and the jury on the other, are not competent to pass opinions upon intricate questions of anatomy, physiology, pathology etc., which are part of the physical examination of a body, and likewise no medical practitioner is qualified to decide the delicate questions of law or the nature and degree of crimes. In other words, whether a homicide has been committed or not is a medical question ; whether that homicide is justifiable or culpable is a legal question. In the celebrated case of Burke and Hare of Scotland, Burke committed about thirty murders by smothering his victims without any external marks, for the purpose of selling bodies to Dr. Knox of Edinburgh for anatomical dissection before he was apprehended and executed. Several other instances can be quoted. Besides, it is a well known fact in medicolegal practice that in many violent deaths there are not any perceptible or suspicious signs of violence on the body of the deceased and these cases escape detection due to obvious reasons. They can only be detected by adopting the medical examiner system.

Medical Examiner's System

In most of the states of the United States of America, the coroner system has been abolished as an obsolete one and the medical examiner's system has been introduced.

The following statute in New Jersey will serve to illustrate the type of death that comes to the attention of the office of the Chief Medical Examiner :—

"When, in the country, any person shall die as a result of violence or by casualty or suicide, or suddenly when in apparent health, or when unattended by a physician or within 24 hours after admission to a hospital or institution, or in prison, or in a suspicious or unusual manner the superintendent or medical director of the institution in which he died, or the physician called in attendance, shall immediately notify the office of the Chief Medical Examiner of the known facts concerning the time, place, manner, and circumstances of the death. Immediately upon receipt of such notification the Chief Medical Examiner or an Assistant Medical Examiner shall fully investigate the essential facts....."

According to this system, a fixed number of medical examiners investigate the cause and manner of all sudden, violent and unusual or suspicious deaths. The dead body and the snrroundings are not disturbed until after the medical examiner has arrived and completed his preliminary investigation. This examination is carried out in co-operation with members of the police force who are specially trained in the investigation of homicidal cases

The function of the medical examiner is to inform. the police the probable nature of the case, offering useful suggestion and supplying them with reports of his examination at the spot and the subsequent necropsy.

As Helpern (1946) points out "It is only by the routine investigation from the very beginning, of all sudden and unusual, as well as suspicious and violent deaths, that unsuspected homicide will be detected. Paradoxically, those medicolegal systems which are concerned only with criminal deaths or obviously suspicious and violent ones fail most often to detect unlabelled homicides". The determination of the cause of death, being recognised as primarily a medical and scientific problem, in most of the states of America is now entirely placed in the hands of medical men qualified through specialised knowledge and experience to handle the case and to render accurate and unbiassed reports of their findings. Until his investigation is satisfactorily completed and the death ascertained, the medical examiner has precedence in authority over all other persons and agencies. Under this system, police investigations are based on the report of the medical examiner who of necessity is the first person to determine in most cases whether or not a crime has been committed, and this is obviously a much more efficient and prompt agency for public protection than the coroner's or the police system.

Trained Men

"Most of the unfortunate blunders known as 'judicial murders' have resulted from the inexperience or ignorance of the medical men engaged in the case, either as witness or as coroner, undertaking to decide medical questions". How truly this statement made by Tyndale (1877) in America applies to our country at the present time can be seen from the following quotation from the Bhore Committee Report : "Every medical practitioner in charge of a remote dispensary whatever his qualification or experience, is asked to undertake medicolegal postmortem in complicated cases of crime and he is liable to be held in question thereafter. The presumption is that every medical man is competent to undertake these responsibilities, but unfortunately neither the profession nor the Judiciary or the State have stopped to consider the absurdity of such a presumption."

There are no medicolegal institutes anywhere in our vast country. The importance of setting up of medicolegal institutes in every country, closely associated with the Universities, for the investigation of medicolegal problems peculiar to each country and for the systematic teaching of forensic medicine has been stressed by Professor Bekaert at the Second International Congress of Forensic Medicine and Social Medicine at Brussels in June 1947. There are only very few places in this country where the post-mortem investigation is carried out by the socalled specialist, whereas in the vast majority of places it is inadequately carried out by improperly trained medical men. Even the so-called specialist, i.e. the teacher of forensic medicine in most of the medical colleges of India, is not trained in forensic pathology but gets his experience in that speciality by sheer efflux of time. The qualifications required of a physician performing medicolegal autopsies according to Helpern (*loc. cit.*) are that "The person entrusted with this examination should be a pathologist trained in that branch of legal medicine called 'forensic pathology' and working in the official capacity of a medical examiner or coroner's physician. There should be adequate facilities at his disposal for the performance of an autopsy and for any other investigation along histological, chemical, bacteriological and serological lines which are indicated by the nature of the case. The fallacious idea exists in the minds of many of the laity and some of the medical profession that any physician, because of eminent qualifications in some other branch of medicine, or any pathologist without medicolegal training, is qualified to carry out this type of postmortem investigation."

Conclusion

A necessary improvement in the teaching and practice of forensic medicine must, in the first place, rest upon the appreciation by those in authority that it requires special training, and that not every medical practitioner can deal with medicolegal cases. It would help a great deal if the practice in certain European countries were adopted that medicolegal experts must have passed through an additional course of training before they are entrusted to hold any such position of public trust.

Secondly, the provinces should be called upon to provide in large centres well equipped medicolegal institutes capable of undertaking all scientific investigations connected with the administration of justice. Such medicolegal institutes should be attached to the medical colleges, wherever possible, and their heads and staff appointed in the first instance only from specially trained men in forensic pathology from reputed institutions such as exist in the United States of America or Europe. Such institutes in India should be provided with all facilities to train the future medicolegal staff.

Thirdly, in each district of a province a place should be selected for conducting all medicolegal autopsies and other medicolegal work of the district by specially trained men. Medical Examiner's system may with advantage be introduced at least in certain important centres of the province where the incidence of homicides is high.

Only then can we avoid the miscarriage of justice.

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CASE NOTE

LUNG ABSCESS WITH PYO-PNEUMOTHORAX

J. S. RASTOGI, M.B.,B.S. (LUCK.),
Medical Officer in-charge Tuberculosis Clinic, Moradabad.

Patient K. S., 36 yrs., H. M. was examined on 1. 11. 1947. with the following complaints :—

Temperature ranging between 101°F and 105°F-40 days, cough-40 days, offensive sputum and breath -20 days, loose motions-15 days, sticky and foul smelling perspiration-15 days and breathlessness-6 days.

Present illness :—The patient was a mate on the panfloor in the Raza Sugar Co. Ltd. Rampur State. Communal disturbances broke out in the State during September 1947. He left the place due to this. At that time he got a severe attack of cough and cold. After a few days he developed pain on the left side of his chest. He, taking it to be an attack of pneumonia, himself took a few tablets of M. & B. 693. In the mean time he developed severe dry cough with persistent high temperature. Pain also increased. He consulted various indigenous medical men, was diagnosed differently as suffering from typhoid fever, tuberculosis and pneumonia and was treated for a few days by each one of them but to no relief.

About the 15th day of his disease he developed high fever and severe cough with blood stained sputum. He was examined by a doctor who diagnosed him a case of pneumonia and kept him on sulfa drugs for one week. His condition became worse. Offensive odour appeared in his breath and sputum. Treatment was again switched on to a Vaidya, who diagnosed him as a case of pulmonary tuberculosis and he was getting Basant kusmakar etc. when I was called in to examine this patient.

EXAMINATION

On entering the room, the most striking thing was the extreme fetor. The patient was lying in the bed slightly propped up. He looked very seriously ill. Body was emaciated and wet with perspiration. Breathing was rapid and shallow; temperature 104·6°F. Pulse 140 p.m. with low tension; clubbing of the fingers present.

Inspection—Left side of the chest showed diminished movement. Intercostal spaces were full. Apex beat visible about ½ inch interior to the nipple line in the 5th space.

Palpation—V. F. decreased in the upper part but increased in the middle zone of the left lung.

Percussion—There was increased resonance in the upper part of the left side of chest but there was dullness lower down with considerable resistance underneath amounting to wooden dullnes.

Auscultation—No breath sounds were audible in the upper part of left lung. Breath sounds were tubular lower down and they changed to vesicular with expiration prolonged at extreme base. No adventitious sounds were heard in the upper part but a few rhonchi were heard along with coarse crepitations at the base.

On the right side of the chest there were no special physical signs except for a few crepitations heard at the base.

Examination of the abdomen—Spleen slightly palpable.

Pathological examinations—Sputum examination showed abundance of pus cells, elastic tissue, streptococci, staphylococci, and pneumococci. No acid fast bacilli were detected.

Blood smear showed marked polymorphonuclear leucocytosis.

Urine : sugar and albumin negative.

Stool : no ova or cyst.

An exploratory needle was put in to collect material for detailed examinations but it was unsuccessful.

X'ray examination—Skiagram no. 1 (For skiagram see plate facing page 355) shows an area of opacity in the lower half of the left side but the left costophrenic angle is clear. The opacity in the upper part is well marked out in a straight line and there is air above it. The collapsed lung lies along the mediastinum.

DIAGNOSIS

The history, the symptoms specially fetor of breath, leucocytosis and the x'ray picture left no doubt regarding the diagnosis. The differential diagnosis had to be considered from :

Pulmonary tuberculosis—The history and the distribution of signs were similar to pulmonary tuberculosis specially when complicated with spontaneous pneumothorax but the points against were : 1. Patient looked more acutely ill. 2. Sputum negative for acid-fast bacilli. 3. Presence of offensive odour in breath and sputum.

Gangrene of the lung—The distinction is not always easy, as it was in this case. The extreme gravity of the patient's general condition, the horrible fetor of breath and sputum were all present. In fact it was almost impossible to decide between the two. As fundamentally, the two processes are similar, difference being only of degree, diagnosis of abscess of lung has been adhered to.

Interlobar empyema, purulent bronchitis and *bronchiectasis* were all ruled out by the distribution of signs and skiagram.

Spontaneous haemo-pneumothorax—It is usually of sudden onset in a previously healthy person or a tuberculous patient recieving A.P. treatment. There are signs of internal haemorrhage and effusion accumulates more rapidly. Onset is marked with shock and pain. All these symptoms were absent in this case.

Amoebic abscess—Lung abscess secondary to the amoebic abscess of the liver bursting into the lung is commonly found on the right side. Patient gives a positive history of amoebic dysentery, high fever, pain, enlarged tender liver and stool examination is positive for *E. histolytica*. All these were absent in this case.

Tumour of the lung—This may sometimes be accompanied by abscess formation. The age of the patient is usually more. The condition is differentiated by the help of bronchoscopy and lipiodol investigation.

TREATMENT

The general treatment consisted in improvement in the ventilation of the room, general cleanliness

around the patient and administration of plenty of fruit juices and fluids ; tincture benzoin compound inhalations by means of a Nelson's inhaler were given every four hours.

The special treatment consisted in :

1. Withdrawal of air from the pneumothorax cavity in order to relieve dyspnoea.

2. Administration of penicillin : 200,000 units of penicillin dissolved in 10 c.c. of double distilled water was put into the pleural cavity by a single injection.

The following table shows the special treatment given :

TABLE—SHOWING THE SPECIAL TREATMENT GIVEN

Date	*Initial Pressure*	*Air withdrau*	*Final ressure*	*Dose of penicillin*
3-11-47	+14+16	300 c.c.	+4+6	200,000 units
4-11-47	+10+12	300 c.c.	+2+5	200,000 units
5-11-47	+ 8+10	200 c.c.	+0+2	200,000 units
6-11-47	+ 4+ 6	150 c.c.	±0+2	200,000 units
7-11-47	+ 2+ 5	150 c.c.	−4+0	200,000 units
8-11-47	discontinued			200,000 units
9-11-47				200,000 units

Under this treatment the symptoms and the signs began to disappear very rapidly. The temperature came down to 101°F within 24 hours and it came down to normal within 48 hours. The horrible fetor of breath and sputum decreased in 48 hours and disappeared in 72 hours. Cough decreased gradually and disappeared in 4 days. The amount of pus began decreasing in 24 hours and totally stopped in 4 days. The general condition improved as time passed from after 24 hours. Toxic diarrhoea and perspiration stopped, appetite improved and in one week's time he was fit enough to be moved safely for another skiagram (no.2) which shows the amount of improvement effected within that time. Gradually pus and air have absorbed and the lung has partly expanded. Patient remained under observation for one month when skiagram no. 3 shows the end result. He has shown steady progress without any set back. There is evidence of marked fibrosis in the left lung as could be expected after such a process. Lung has expanded. Heart and mediastinum have been pulled on the same side.

DESCRIPTION

Lung abscess has been defined as a localised purulent infection of the lungs. It includes any circumscribed collection of pus formed in lung tissue, but softened tuberculous areas and bronchiectatic accumulations are usually excluded.

Abscess formation is a manifestation of the result of continued action upon the body tissues of a bacterial irritant. If the infection is mild, suppuration may be avoided but if the infection is of greater severity, tissue destruction is extensive and suppuration results. The term gangrene is often erroneously used as though it were entirely different from abscess ; but the two are fundamentally the same ; difference between abscess and gangrene is that of degree rather than of kind. It may be convenient to separate them clinically but it is not always possible to draw a sharp line of differentation between the two.

Conditions which predispose to abscess formation are the diseases producing general cachexia or malnutrition notably diabetes and chronic alcoholism ; also any condition leading to diminished resistance locally in the lung such as injury, disease or exposure. The exciting causes are the pyogenic organisms which reach the lungs either by inhalation, extension or circulation. The common organisms are streptococci, staphylococci and pneumococci, Other organisms as pneumo bacillus, bacillus Welchii, B.coli and other anaerobic organisms may be present.

Pulmonary abscess may be formed under the following conditions :

1. Inhalation of foreign septic material, *e.g.*, after operations on nose, nasopharynx, larynx, or teeth.

2. As a result of lobar or lobular pneumonia called meta pneumonic.

3. Embolic : *e.g.* in pyaemia, otitis media, septic thrombophlebitis or amoebic abscess after dysentery.

4. Contiguous spread from adjacent disease, *e.g.*, in bronchiectasis, ulcerating new growths of the lung, bronchi, oesophagus or mediastinal glands, in caries of vertebrae or ribs or suppurative mediastinal glands, rupture of an empyema or a subphrenic liver abscess or infected hydatid cyst of lung or liver.

5. As a sequel of perforating chest wounds or fractured rib piercing the lung.

Metapneumonic and foreign body abscess is generally single and large but embolic abscesses are usually small and multiple. In extension abscess, the contiguity can be made out.

DISCUSSION

This patient has been in employment of the sugar factory for the last 14 years. The only obnoxious gas that can be inhaled there is SO_2. He by way of his employment, as a mate on the panfloor, does not come in contact with this gas, though occasional inhalation may not be out of question. It is, therefore, very uncertain whether his employment in the sugar factory acted in any way as a predisposing factor by lowering the local vitality of the lungs. It is, however, beyond doubt that his vitality was lowered as a result of worry and strain during communal disturbances, and this acted as a predisposing factor. Most probably he got an attack of pneumonia which due to uncertainties of his own life was neglected and became resistant. The onset is thus insidious as is revealed by his history. Fetor in breath and bloodstained sputum appeared when the abscess burst into the bronchus which was followed by the discharge of foul pus-like sputum. The bouts of cough show that the time intervening between them was taken for the cavity to fill. Dyspnoea synchronised with the development of pneumothorax. Skiagram has been most helpful in deciding about the diagnosis. Prognosis in such cases is very grave. Condition of the patient was very serious at the time of first examination. Treatment was immediately started with intrapleural penicillin. It was thought to supplement the intrapleural route with systemic injections but observation and the result produced within 24 hours encouraged to continue with intrapleural penicillin only. Intrapleural penicillin acted as a topical application or an internal dressing over the diseased part and thus produced the maximum therapeutic effect in the minimum time. Result produced was dramatic and improvement beyond expectations. The case is still on the follow up list and there is steady progress. Skiagram no. 3 shows the amount of fibrosis that has developed to make good the damage to the lung parenchyma. Result has thus been ideal.

JOURNAL OF THE
INDIAN MEDICAL ASSOCIATION

CALCUTTA, AUGUST, 1948

STREPTOYMCIN IN TUBERCULOSIS

Various living organisms have the peculiar need and method of protecting themselves. As a result they produce noxious material in the environment they live, so that their enemies cannot do any harm to them. Such a product is penicillin. It was soon realised, that though penicillin possessed many advantages, therapeutic advance over sulphonamide group of drugs has been rather small. The discovery of penicillin was an important event, because it opened up an avenue hitherto unexplored. And a result of this search is the discovery of streptomycin, the antibiotic principle prepared by Waksman in 1944 from steptomyces griseus.

Streptomycin is active against many Gram-negative bacilli. Its chief interest lies in its action against Mycobacterium tuberculosis, because tuberculosis is a deadly disease and we have little in our hands to fight it dirctly.

Streptomycin is being used today in India for all kinds of tuberculosis. But neither any research organisation nor any Government Institute has come forward to help the general practitioner in the use of this new antibiotic. Many reports have been published on its clinical trial by various organisations, notably in America, England and France.

Feldman and Hinshaw[1] of Mayo Clinic in U.S.A. studied the use of streptomycin in all forms of tuberculosis. They are of opinion that 'it is now well established that streptomycin treatment may be effective in bringing about a clinical remission in a considerable percentage of cases of miliary tuberculosis and of tuberculous meningitis'. They have followed up cases which have remained well upto two years after the treatment. They think that if these cases are diagnosed early at least 50 per cent of them can be successfully treated. Of its use in pulmonary tuberculosis they opine that 'there is increasing evidence that streptomycin combined with collapse therapy and other forms of treatment may be effective when either alone would probably fail'. They would use streptomycin even in progressive cases and they have observed at least temporary arrest of the disease-process after streptomycin therapy.

Streptomycin has been successfully used by these workers in tuberculous laryngitis and endobronchitis. In the tuberculous sinuses, lymph nodes, bones and joints, streptomycin has been used and it was found that 'clinical results are satisfactory in a very high percentage of cases'. Even tuberculous enteritis and peritonitis had to yield to the therapeutic action of streptomycin.

Medical Research Council in England, decided to restrict the tests at the outset to a few acute and usually fatal forms of the disease, including tuberculous meningitis in children and acute miliary tuberculosis.[2]

They also conclude that for this purpose streptomycin is an useful adjunct in the armamentarium of the physician. The M. R. C. has formulated that an early diagnosis should be made from history, clinical signs and full investigation (history of contacts, Mantoux test, chest radiogram, examination of eyes for choroidal tubercle and lumbar puncture). The treatment should be started as soon as possible. Smith and other workers[3] in Oxford also concluded that 'the practical value of streptomycin in the treatment of tuberculous meningitis has been established.'

So there is no question regarding the importance of streptomycin in the treatment of tuberculosis. But before we can recommend this therapy for general use a long period of observation is necessary to evaluate the final result of streptomycin therapy.

Streptomycin is an irritating drug, some salts are painful when injected intramuscularly and a little novocaine can obviate this. The dosage and the route of administration has been provisionally settled. Cathie[4] found good and encouraging results with a dose of 0·02 gm. per lb. of body weight per day given in distilled water intramuscularly.

From the MRC reports it seems that cases of meningitis treated with combined intramuscular and intrathecal injections had an unusually high proportion of recovery. Of 72 cases treated in this way 27 (37%) were alive after seven months or more. Age brings about another problem. Of 33 under three years of age, 27 died four or more months after treatment was started, of 72 older patients only 40 died. Cases do relapse after making good recovery and in some cases the bacteria become streptomycin resistant. Of the late results, mental deficiency and hydrocephalus have been reported.

Streptomycin is an useful drug but it must be used under controlled observation as shown by the measures taken by MRC. in England. Cathie is of opinion that : 'it must be realized that the streptomycin treatment of tuberculous meningitis cannot be lightly undertaken. Apart from full laboratory facilities for controlling the clinical pathology of a case much extra nursing is required, continuous medical supervision is necessary, and from patients' point of view there will be a course of intramuscular injections lasting for six months or more, apart from intrathecal and general supporting treatment. Only the fullest and continuing co-operation of everybody concerned and even in the most successful cases with apparent cure, prolonged subsequent observation is necessary owing to the possibility of relapse.'

These directions bring in new problems for our country. In India quite a large amount of Streptomycin is being used in private practice with almost

1. Feldman, W. H. and Hinshaw, H. C.—*Brit. M. J.*, 1 : 87, 1948.

2. MRC Report —*Lancet*, 1 : 582, 1940

3. Smith Honor V., Vollum R. L. and Cairns H.—*Lancet*, 1 : 627, 1948.

4. Cathie, I. A. B.—*Post Gradute Medical Journal*, 24 : 351, 1948.

none of these facilities available. Whether the spasmodic use of streptomycin is justified is a pertinent question today, considering the fact that streptomycin is a costly drug and supply is not abundant. American workers have shown that Mycobacterium tuberculosis often becomes *resistant* to streptomycin, specially in pulmonary cases. So there is a possibility that we will very soon produce a resistant strain of Mycobacterium tuberculosis, which will defy our latest drug with impunity. Furthermore, the clinical improvement often masks the real lesion underneath and a false sense of security is produced thereby in the patient, his relatives and also in the doctors, with the result that in some cases proved methods of treatment, specially surgical, are refused. Moreover, the apparent clinical improvement in uncontrolled patients makes people forget the basic hygienic principles; and the advice to take rest is not adhered to. As a result the patient becomes a menace to his family and does untold harm to himself. We hope the physician who uses streptomycin in private practice will keep these points in mind.

NOTES AND NEWS

ALL-INDIA MEDICAL CONFERENCE, 1948

Scientific Sub-committee :—*Chairman*—Dr. A. C. Ukil, M.B., M.S.P.E. (Paris), F.N.I. *Secretary*—Dr. B. P. Neogy, M.B., M.R.C.S. (Eng.), M.R.C.P. (Lond.) *Office*—67, Dharamtala Street, Calcutta—13.

The Calcutta Branch of the Indian Medical Association has invited the 25th (Silver Jubilee) Session of the All-India Medical Conference to be held during the Christmas week this year in Calcutta.

Members if the profession who desire to read papers in the scientific session of the Conference, are requested to send a synopsis of the paper to the undersigned by the 15th October 1948. Original copes of all papers must reach the office by the first week of December. The Synopsis must not exceed 500 words and need not contain any graph, chart or formula. Contributions shall not contain more than 3,000 words of reading matter for the Conference.

It is hoped that the profession will co-operate with the Sub-committee in making the scientific Session a success.

THE INDIAN SCIENCE CONGRESS

Sir K. S. Krishnan, Kt., D.SC., F.R.S., Director, National Physical Laboratory, New Delhi, has been elected General President of the Indian Science Congress Association for 1948-49 and the following have been elected as Sectional Presidents :

Mathematics—Prof. S. Chowla, (Delhi) ; *Statistics*—Dr. U. S. Nair (Trivandrum) ; *Physics*—Dr. R. S. Krishnan, (Bangalore) ; *Chemistry*—Prof. P. B. Ganguly, (Patna) ; *Geology and Geography*—Dr. C. Mahadevan, (Waltair) ; *Botany*—Mr. M. S. Randhawa, (Delhi) ; *Zoology and Entomology*—Dr. M. L. Roonwal, (Benares) ; *Anthropology and Archaeology*—Sri N. K. Bose, (Calcutta) ; *Medical and Veterinary Sciences*—Dr. M. B. Soparkar, (Bombay) ; *Agricultural Sciences*—Dr. R. S. Vasudeva, (New Delhi) ; *Physiology*—Dr. B. B. Sarkar, (Calcutta) *Psychology*—Mr T. K. N. Menon, (Baroda) ; *Engineering and Metallurgy*—Prof. M. Sen Gupta, (Benares).

LATEST ANTIMALARIALS

Of the 80 compounds prepared at the University of Maryland, two are most successful as antimalarials. They are 7-chloro-4-(-4-diethlamino-1-methyl butyl amino)-quinoline or chloro-quine, and 8-(5-isopropyl-amino-amyl-amino)-6-methoxy-quinoline or pentaquine. Cloroquine had been patented by the Germans, but was unavailable in quantities sufficient for early clinical testing. Pentaquine was developed in analogy with plasmoquine—*Chemical & Engineering News*, 26: 454, 1948.

NEW DRUG FOR TYPHUS FEVER

A United States army medical research team in Malaya claims that a new drug, one of the penicillin family, will cure scrub typhus in 24 hours, just as 'aspirin' will relieve a headache in 30 minutes. The drug, known as Chlormycetin is the third of the penicillin group. Dr. Joseph Smadeu, leader of the team, said that after 48 hours of experiments here "we knew we were in". Every one of the 22 cases treated was cured, the average duration of the fever being 31 hours after administering the drug. Ordinarily scrub typhus lasts 15 to 20 days and in Malaya an average of 15 cases out of every 100 are fatal—*General Practitioner*.

RICE-EATERS MUST EAT MORE FRUITS

Dr. W. R. Aykroyd, Director of the Nutrition Division of the United Nations Food and Agriculture Organisation, said the high precentage of rice in the diet of the people of India was directly responsible for widespread malnutrition in that area.

He told the Fourth International Congress on Tropical Medicine and Malaria that while various new methods of preparing rice would remedy its vitamin deficiencies in some respects, the basic trouble was that "whatever kind of rice is eaten typical rice diets are defective because they contain too much rice."

He said, "A greater consumption of food of animal origin, milk, meat, eggs and fish, would effectively improve nutrition in rice-eating countries." He said rice-eaters also should eat more pulse, beans, vegetables, fruits, roots and tubers, yeast and coconuts."

Dr. Aykroyd disclosed that the FAO purposes to set up a regional office in East Asia shortly to co-ordinate and stimulate work on nutrition and to develop rice and rice diets.

He said deficiency diseases were diminishing generally, but that investigations in the Madras Presidency during 1939 to 1945 had showed that infant beri-beri was much more common than had formerly been supposed and was responsible for a

high infantile mortality rate. An early injection of thiamine, the B_1 vitamin, was effective treatment of the disease if recognised in time.

Dr. Aykroyd identified cirrhosis of the liver as the most common deficiency disease in the tropics and the East—*General Practitioner.*

NUTRITION BY NATURAL FATS

In a feeding experiment with young white rats the fat in the balanced diet was varied in quality and the growth was compared. The increase in weight in eight weeks when the fat was butter fat, was the standard, 100 per cent, palm kernel oil induced 98·6, palm oil 96·9, cocoanut oil 93·2, salad oil 91·8, hydrogenated sardine oil 84·3 per cent. Hence nutritionally natural fats are far superior to processed fats and almost as good as butter fat—*Science & Culture.*

NEW FELLOWS OF THE ROYAL SOCIETY

The Royal Society has elected the following amongst others into the Fellowship of the Society :—

Robert Alexander McCance, Professor of Experimental Medicine, Cambridge University ; distinguished for contribution to metabolic studies of human beings.

Dorothy Mary Needham, Biochemist, School of Biochemistry, Cambridge University ; distinguished for researches on the biochemistry of muscle.

Sir Leonard Gregory Parsons, Emeritus Professor of Diseases of Children, Birmingham University ; distinguished for studies on child health and the wasting disorders of children.

Stanley Peat, Reader in Organic Chemistry, Birmingham University ; distinguished for contributions to constitution and synthesis of carbohydrates. William Albert Hugh Rushton, University Lecturer in Physiology, Cambridge ; distinguished for researches on the effect of electrical stimuli on muscles and nerves.

ATOMIC MEDICINE CENTRE IN NEW YORK

The first medical and biological training and research centre devoted to atomic energy therapy is to be built at the University of Rochester, New York. The centre will train medical men in the treatment of cases suffering from the effects of radiations from radioactive materials. It will provide post-graduate training in the use of radioactive isotopes for traces studies and therapy and in the treatment of radiation sickness.

Instruction will be provided in pharmacology and toxicology of radioactive substances, on principles of shielding against radiation, design of radiochemical laboratories, prevention of radioactive contamination, hazards of reactor operation and disposal of radioactive waste—*General Practitioner.*

THE NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

On behalf of the Tuberculosis Educational Institute, the NAPT will organise several Refresher Courses during 1948.

For Doctors : RADIOLOGY IN CONNECTION WITH TUBERCULOSIS AND CHEST DISEASES, at Leeds University, 20th. to 22nd. September. Fee £4.4.0. Limited inclusive accommodation at Leeds University Hostel : £2.15.0.

For Doctors : THE TREATMENT OF NON PULMONARY TUBERCULOSIS including LUPUS, at Lord Mayor Treloar Cripples' Hospital, Alton, Hants. 5th. to 7th. October. Fee £3.3.0. Reserved hotel accommodation : approximately £1.1.0. per day, dinner, bed and breakfast. Course limited to 16 Doctors.

For Doctors : CLINICAL COURSES at the Cheshire Joint Sanatorium, Market Drayton, Salop, 26th. to 28th. October, 23rd. to 25th. November, and 7th. to 9th. December. Fee £3.3.0. Hotel accommodation in Market Drayton can usually be obtained at approximately £1.1.0. per day, dinner, bed and breakfast. Courses limited to 4 Doctors

For Nurses and Social Workers : THE SOCIAL ASPECT OF TUBERCULOSIS AND CHEST DISEASES, at Leeds University, 22nd. to 25th. September. Fee £1.1.0. Limited inclusive accommodation at University hostel : £2.15.0.

BOMBAY MEDICAL COUNCIL

The following are the New Code of Medical Ethics and the Warning Notice adopted by the Bombay Medical Council in substitution of the old code. The New Code comes into force with effect from 1-7-48 :—

CODE OF MEDICAL ETHICS

In taking up the medical profession you have selected as one which is universally considered as the noblest, as its primary object is the alleviation of human suffering irrespective of gain.

It is your duty to do the best for your patients. You are not bound to treat each and every one who seeks your help, except in emergencies. You have the right to choose the patient and to lay down the limits of your service. But once you accept the charge it is your responsibility to exercise due care and diligence in the diagnosis and treatment, using the best means and opinions available to you. You cannot leave the patient without his consent except for very valid reasons. The discovery that the malady is incurable is not an excuse. Undertaking the care of a patient does not imply that you shall be blamed for not curing him. No blame will be attached if you have employed that skill and professional knowledge which your other colleagues with a like qualification do in the community. Naturally more is expected of one who claims to be a specialist.

Your demeanour towards the patient should be courteous, sympathetic, friendly and helpful.

While keeping the interest of your patients uppermost, you are not permitted to perform illegal operation or execute an illegal document or issue a false certificate.

Knowledge of a patient gained in the course of examination and treatment is privileged and should not be disclosed without the consent of the patient or an order from a presiding judge in a Court of Law.

To other members of the profession you owe a

duty as a colleague. You should never do anything which you would not like them to do to you. Do not undertake to treat a patient who you know is being treated by another physician nor do or say anything that may make the position of your colleague awkward. Most of the suits for malpractice arise out of such remarks. Always respect opinions and differences of opinion.

In practising your profession use methods of fair competition. It is unethical to advertise yourself or solicit practice in any way.

WARNING NOTICE

The Bombay Medical Council desires to bring to the notice of Medical Practitioners whose names are entered in their Register that if after due enquiry the Council finds them guilty of the following and similar unethical practices they are liable to be warned or have their names erased from their Register. The Council is in no way precluded from considering and dealing with any form of unethical practice which may be brought before them although it may not appear to come within the scope of precise wording of any of the categories mentioned below :—

PART I

Note.—Anyone found guilty of offences mentioned in this Part will be liable to have his name erased from the Register without any further warning.

1. Immorality involving abuse of professional relationship.

2. Conviction by a Court of Law for an offence involving moral turpitude.

3. Issuing in connection with various Government and Municipal Acts, sick benefit, insurance and kindred societies, passports, matters relating to armed forces, attendance in Courts of Justice, in the public services, or in ordinary employment, a certificate, notification or report which is untrue, misleading or improper.

4. Withholding from the Health Authorities information of the Notifiable Diseases.

5. Performing or enabling an unqualified person to perform an abortion or any illegal operation for which there is no medical, surgical or psychological indication.

6. Performing or enabling an unqualified person to attend, treat or perform operations on patients in respect of matters requiring professional discretion or skill or to issue certificates.

7. Contravening the provisions of the Drugs Act and Regulations made under it.

8. Selling scheduled poisons to the public under cover of his own qualifications, except to his patients.

9. Disclosing the secrets of a patient that have been learnt in the exercise of his profession. Those may be disclosed only in a Court of Law under orders from the presiding Judge.

10. Soliciting private practice either by spliting fees or paying commissions to those who bring patients to him or by advertising by means of laudatory or other notices in the press, or, by placards or by handbills.

11. Receiving commissions from surgeons, consultants, or from anyone to whom patients are referred to, be it a medical practitioner, a manufacturer or of trader in drugs or applicances or a chemist or a dentist or an oculist.

12. Advertising himself directly or indirectly such as through pricelists or publicity materials of manufacturers or traders with which he may be connected in any capacity though it will be permissible for him to publish his name in connection with the prospectus or directors' or technical experts' reports.

PART II

13. Associating in professional matters with persons who do not possess a qualification registrable in India or who possessing such a qualification have been struck off the respective Registers for unethical practices.

14. Writing prescriptions in a secret formula.

15. Keeping an open shop for the sale of medicines.

16. Publishing or sanctioning the publication in the lay press of reports of cases treated or operated on by him or of any certificates for drugs, foods, appliances, sanatoria used by him or of any laudatory statement about himself or his address and telephone number unless he has changed his offior has resucemnp practice after a long interval in ce which case the noe should not appear more than twice and in not nore than two papers, or inserting his name in the telephone directory in a special place by paying special rates.

17. Contributing to the lay press interviews, letters regarding disease and treatment which have the purpose of advertising himself and soliciting practice. It shall be open for him to write to the lay press under his own name on matters of public health interest and general articles which will promote hygienic living or deliver public lectures with the same purpose. Till such time as local medical publications offered desired publicity it shall be open to medical associations, hospitals and other bodies to advertise the name of the lecturer and his subject in the non-medical press provided that such a notice has already been sent to the medical press for publication, where available.

18. Attending a patient who is under the care of another practitioner.

19. Attending on his own a patient who has been seen by him before in the capacity of a consultant during the same illness.

20. Removing the patient in the absence of the attending physician to a hospital or a nursing home or transferring him to the care of his assistants by a consulting practitioner.

21. Doing anything that means unfair competition.

22. Talking disparagingly of his colleague who attended the case before him or attends with him at a consultation.

23. Examining and reporting on employees at the instruction of the employer without previously intimating the regular medical attendant of the employee of his commission and giving him the option of being present.

24. Using an unusually large sign board and writing on it any thing else other than his name, qualifications obtained from a university or a statutory body, titles conferred by Government and the name of a speciality he practises. The same should be the contents of his precription paper, which may in addition contain address and telephone numbers. Appointments held now or before should not be mentioned either on the board or prescription paper.

25. Refusing to attend on a patient who has been under his care unless :—(1) He finds that the patient and his relatives are un-co-operative. or (2) His fees are not paid or (3) another practitioner is consulted without his knowledge.

SUGGESTIONS

Note :—The foregoing do not apply so as to restrict the proper training and instructions of *bona fide* students or the legitimite employment of dressers, midwives, dispensers, surgery attendants and skilled mechanics under the immediate personal supervision of a registered medical practitioner.

The following sugestions may be useful in medical practice :—

1. You should strive to maintain your medical knowledge at a high level by regular reading, by attending refresher courses whenever available, and by attending and taking an active interest in the meetings of your local medical society and conferences. Add your knowledge and experience to the common pool and thus contribute to the advancement of medicine.

2. Never forget that the doctor by virtue of his profession is given a high place in Society. Study and assist in solving the civic and political problems of your Society but not by neglecting your patients and profession. Do nothing to forfeit the esteem and the confidence of your fellowmen. In thought, word and deed be a gentleman.

3. Every practitioner may charge a fee at each examination of patient and he should encourage the latter to get the medicine from a qualified pharmacist, as the small profit accruing from dispensing medicines to his patients is not adequate remuneration for his professional services.

4. In serious illness, in doubtful conditions, in operations of a mutilating or destructive nature upon an unborn child, in operations which may vitally affect the intellectual or generative functions of the patient always ask for a consultation.

5. At the consultation there should be a free exchange of opinion. These discussions should be held without the presence of the patient or his relative. An agreed statement or otherwise should be communicated to them by the attending physician.

6. Before performing an operation, obtain in writing the consent from the husband or wife, parent or guardian or the patient himself as the case may be. In an operation which may result in sterility the consent of both husband and wife is needed.

7. Do not undertake more work than you can conveniently manage. If you are running a dispensary practice avoid over-crowding by not calling patients twice or every day, unless it is essential to do so. To many medicines may be given for three days. Charge your fees every time you examine a patient. If you agree to attend a woman in her confinement you must do so and the excuse that at that time you are engaged with another patient and could not leave is not valid.

8. Though your fees may vary according to the means of your patients, do not attend patients free of charge unless they are poor. There are hospitals for the poor.

9. If your patients need investigation and technical assistance which is beyond you and beyond the limits of the purse of patient do not delay in referring him to a public institution.

10. Do not claim to be a specialist unless you have put in a good few years of study and experience or have a special qualification in that branch. Once you say you are one, do not undertake work outside your speciality even for your friends. Live and let live.

11. If you are running an institution for a particular purpose such as a mental home, a sanatorium, a house for cripples ; blinds etc., you may advertise it in the lay and medical press. The advertisement should not contain anything more than the following information :—

Name of the institution, the address and the approach, the types of patients admitted, facilities offered and the residential fees. The name of the Superintendent may appear in the Medical Press. It is not advertisement to celebrate the annual function of your institution and invite your friends to it ; such a function should not be reported in Press.

12. While it is scientific to offer a good prognosis, if one's findings lead to it, it is unwise to guarantee a cure.

13. Prescriptions, X-Ray plates, investigation report, are the property of the patient.

14. When issuing a medical certificate always enter the identification marks of the patient and keep a copy of the certificate.

15. Do not publish photographs or case reports of your patients in medical or other journal in a manner by which their identity could be made out without their permission. Should the identity be not disclosed his consent is not needed.

16. If you are running a nursing home and of you employ assistants to help you, the ultimate responsibility rests on you.

17. Do not accept appointments, whether honorary or salaried in institutions where the practice is to "split fees" for visits and injections between the practitioner and the institution.

CURRENT MEDICAL LITERATURE

Spastic Colon

Seward (*Med. Press.* Ref. *Med, World.*, **67** : 245, 1947) writes that the pain may be felt in the lelt iliac fossa or in the right iliac fossa due to ballooning of the caecum. It may, however, be experienced diffusely over the hypogastric regiod. The pain varies from a dragging ache to a severe colic. Cold often brings on an attack. Food increases the pain. Jolting of the body also tends to make the phin worse. Evidence of allergy is found in a large proportion of cases. During attacks of pain belladonna or adrenlin may be given. If the pain is severe, a capsule of amyl nitrite may be inhaled, or trinitrin (0·5 mgm.), one or two tablets, may be given. Local heat or a warm bath will relax the spasm.

Sulphamerazine in Pneumonia

Joules and Weller (*Brit. M. J.*, **2** : 947, 1947) present a series of cases of primary pneumonia in adults treated with sulphamerazine. No deaths occurred among 113 cases so treated. Five deaths (7% mortality) occurred among 76 treated with other agents, including combined therapies. The total mortality was 3%.

It is claimed that sulphamerazine, which can be given in relatively small doses at eight-hourly intervals, is a satisfactory therapeutic agent for this disease. The results are such that pneumonia can be treated at home and be reduced to a "two-day fever." Should no response follow within 48 hours the case should be reviewed at once and the facilities provided by the hospital for further investigation and treatment be employed.

The need for radiological demonstration of complete resolution is emphasized, as is the need for adequate convalescence.

Hypertensive Headache Treated with Potassium Thiocyanate

Mills (*Lancet*, **I** : 324, 1947) reports that postassium thiocyanate is known to be a normal physiologic constituent of the blood and saliva and, therefore, acts by replacing the salivary thiocyanate, which is low in many cases of malignant hypertension. Thiocyanate is also a vasodilator, but the symptomatic relief it gives does not correspond to the slight lowering of blood pressure that may occur.

The symptoms which respond most readily to this drug are headache and dizziness. The effect on the blood pressure varies widely. The drug usually causes some lowering of both systolic and diastolic readings after one or two weeks' treatment but this lowering of the pressure is not maintained, although symptoms continue to be relieved. There is no definite relationship between lowering of the pressure and the relief of symptoms.

After a study of twenty-seven cases of benign hypertension and ten cases of malignant hypertension, in which headache and giddiness were prominent symptoms, the author reaches the conclusion that this drug has a definite but limited place in the treatment of hypertension and should be restricted to cases in which hypertensive headache is a predominant and troublesome symptom and does not respond to simpler forms of therapy.

He states that this drug does not affect the course of the disease ; nor does it permanently lower the blood pressure even in cases in which there is much symptomatic improvement.

Treatment of Myasthenia Gravis

Although thymectomy has produced dramatic improvement in some cases of myasthenia gravis, (Blalock—*J. Thorac. Surg.*, **33** : 316, 1944) and the experimental use of diisopropyl fluorophosphonate has opened up a new field, there are still many patients who continue to get relief from 'prostigmin.' This substance and others may enhance its effect from the basis of the medical treatment of the disease. It was in 1936 that Dale, Feldberg, and Vogt (*J. Physiol.*, **86** : 353, 1936) showed how acetylcholine is released at voluntary nerve endings when a volley is discharged down the motor nerve. Previously Mary Walker (*Lancet*, **I** :1200, 1934) had used physostigmine with striking success in a case of myasthenia gravis, because the disease closely resembled curare poisoning, for which physostigmine was known to be an antidote. Since then its derivatives have been employed, the most successful being prostigmin or 'neostigmin' (Walker—*Proc. Roy. Soc. Med.* **28** : 759 1935) and also neostigmin methyl sulphate (Viets—*Am. J. Med. Sc.*, **208** 701, 1944). Ephedrine (Edgeworth—*J. A. M. A.* **94** : 1136, 1940) may be given as well with advantage in some cases, and guanidine has also been found helpful (Minot and others—*Science*, **87** : 348, 1938). Froke, Margoshes and Harrell (*N. Carolina M. J.*, **7** : 462,1946) tried guanidine in doses of 25 mg. per kilo of body weight in association with prostigmin and found that subjectively, and also on measurement of the myasthenic response with a recording ergograph, there was material improvement in the patient's muscular efficiency.

It is generally recognized that in myasthenia gravis there is a disorder of the acetylcholine mechanism at the myoneural junctions, but its exact nature is still unknown. Froke and his co-workers have analysed the possibilities. The first, that cholinesterase, which breaks down acetylcholine into choline and acetic acid, is present in excessive amounts, was discounted by the work of Cooke and Passmore (*Quart. M. J.*, **5** : 21, 1936) The second, that acetylcholine is not liberated, is ruled out by the action of prostigmin, which merely prevents its destruction. The third is that acetylcholine is found in abnormally small amounts. This might be due to lack of precursor substances, lack of potentiator substances, or excess of inhibitor substances. This possibility is supported by the observations of Torda and Wolff (*Arch. Neurol. Psychiat.*, **52** : 554, 1944), who found that the serum of myasthenic patients only produced one-third the amount of acetylcholine synthesized by normal serum in the presence of frog's brain *in vitro*. It is also supported by the direct observation of the effects of prostigmin and acetylcholine in varying amounts in myasthenic patients compared with normal subjects. The last possibility is that the myasthenic muscle fibres might be less sensitive to the action of acetylcholine than those of normal subjects, but there is no doubt that the muscles in myasthenia are unusually sensitive to acetylcholine injected directly into an artery. Minot considered that such might be the reason for any potentiating action which guanidine might have on prostigmin, and it is possible that guanidine makes myasthenic muscle fibres contract more efficiently in the presence of prostigmin. If it does, it will enable a smaller effective dose of prostigmin to be given as suggested by Froke, Margoshes, and Harrell, but it must be remembered that its use in the muscular dystrophies, which was based on a similar theory, proved disappointing—(*Brit. M. J.*, **2** : 966, 1947.)

Prostigmine and Tridione in Spastic Neurological Disorders

Denker and Kaplan (*Bull. N. Y. Acad. Med.*, **23** : 472, 1947) write that neither prostigmine nor tridione produced any significant therapeutic effect on muscle spasticity in fifty cases of various neurological disorders, with the common manifestation of demonstrable increase in muscle tonus. This lack of improvement is in sharp contrast to the reported benefits from prostigmine on muscle spasm associated with poliomyelitis, extremity fractures, rheumatoid arthritis, fibrositis, etc. and does not compare favourably with the results of prostigmine or tridione therapy reported by some investigators in the management of infantile cerebral spastic palsy.

An explanation may be offered for this discrepancy of results. It is possible that the proposed hypothesis for the central action of prostigmine in cases of muscle spasm is in error, and that the drug acts in the usual manner at the neuromuscular junction, relieving spasm only when it is the result of increased muscle irritability on the basis of local inflammatory processes or reflex spams from involvement of anterior horn cells. This type of action may not, therefore, be expected to relieve spasticity based on destruction of pyramidal or extra-pyramidal tracts in the central nervous system. There is the additional possibility that previous favourable reports of the action of prostigmine on diseases with muscle spasm reflect more the results of concomitant physiotherapy than of the drug action itself.

Cancer of the Prostate

Guzman (*Radiology*, **49** : 214, 1947) gives in the following lines the summary of his observations :

We are in agreement with Barringer that treatment of prostatic carcinoma with radiation will relieve dysuria and prolong life in comfort. We believe that the results compare favourably with those of transurethral resection, which was reported by Thompson and Emmett (20) as giving 74 per cent of one-year survivals in a series of 253 cases; 46 per cent two-year survivals, 31 per cent three-year survivals, 17 per cent four-year survivals, and 8.7 per cent five-year survivals.

We believe that before instituting treatment for any case of prostatic carcinoma, the method of choice for that case should be determined, whether transurethral resection, irradiation, or castration with or without estrogens, or some combination of these procedures.

We believe irradiation is most useful in reducing the volume of the primary tumor and relieving pain due to metastases. If estrogens and castration fail, as they may in tumors arising in the periurethral glands, radiation can still be employed.

We agree with Munger that adequate testicular and regional irradiation diminishes hormone production (by regional irradiation we mean irradiation to the lumbo-aortic and suprarenal regions).

We believe that irradiation should be given not only to the testes and the pelvis, but to the suprarenals and hypophysis to eliminate all extragonadal sources of androgen.

Finally, we believe that nothing takes the place of early diagnosis, permitting radical operation without undue risk.

Hormone Treatment of Cancer of the Breast

Since the original reports (Discussions, *Proc. Roy. Soc. Med*,. **37** : 371, 1947 and Haddow and others—*Brit. M. J. 2* :293, 1944) on the occasional clinical retrogression of carcinoma of the female breast after the administration of stilboestrol little has been added to our knowledge of the carcinostatic effect of the sex hormones. A recent paper from New York (Hermann and others—*Arch. Surg.*, **54** : 1, 1947)reports the administration of ethinyl oestradiol, a synthetic oestrogen, to 17 patients suffering from mammary cancer. This account shows how inadequate are our yardsticks for estimating the retrogression of human tumours. There is no available method of measuring with reasonable accuracy the volume of even an accessible tumour, and clinical estimates of increase or decrease in size are notoriously fallacious. Only complete disappearance can be accepted as clear proof of a decrease in size.

Certain dramatic qualitative phenomena, however, are acceptable as evidence of retrogression, and these were sometimes seen in the series described by Herrmann and his coworkers. A decrease in size of pre-existent carcinomatous ulcers was observed in two cases and graphically recorded, and there was complete healing of an ulcer in a third case. A decrease in the size of pulmonary metastases was measured radiographically in two cases. A protuberance photographed in profile had flattened out after two months' treatment. In no case did the primary tumour or a metastasis completely disappear. Serial biopsies showed no alteration in the histological or cytological pattern of tumours that appeared to regress under treatment. The microscopical picture altered after treatment in only one tumour, and that increases in size during treatment. In one patient the breast tumour increased in size and fungated rapidly at the very time when a pulmonary metastasis from it appeared to be shrinking.

The authors consider that there was a favourable response in 7 of the 17 cases, and this response was obtained for the most part in women over 60 years of age. In young women oestrogen therapy actually appeared to hasten the growth of the tumour. Of the 17 patients 7 died of the disease, and one of coronary occlusion, within eighteen months of starting treatment. Of the 7 patients who died 5 were under 60 years of age; indeed no patient under 60 years of age survived for longer that eighteen months. This series is a small one, but patients selected for oestrogen therapy are necessarily those who are unsuitable for operation or for radiotherapy or whose disease is resistant to these other forms of treatment. In this sense it is gratifying that their numbers are relatively few and that substantial series are therefore slow to accumulate —*Brit. M. J.*, **2** : 965, 1947.

Pregnancy Complicating Tuberculosis

Barone and others (*Am. J. Obstet., Gynec.*, **54** : 475, 1947) in presenting a review of 62 tuberculous patients with a complicating pregnancy observes :

The known incidence of tuberculosis complicating pregnancy at the Elizabeth Steel Magee Hospital is 0·35 per cent

The final gross mortality in this survery was 33·8 per cent. and the corrected final mortality was 30·6 per cent.

The mortality for the patients who delivered spontaneously was 19·2 per cent.

The mortality for the patients who delivered by cesarean section was 36·3 per cent.

The mortality for the tuberculous patients in whom the pregnancy was terminated within the first trimester was 38·5 per cent.

Sixty-one and five-tenths per cent of the 62 patients had moderately advanced or far-advanced active tuberculosis; 44·8 per cent of these patients are dead. This included all types of deliveries including therapeutic abortions.

The best results in this survery were obtained in those patients who were delivered spontaneously regardless of the extent of the tuberculosis

To determine tuberculous activity, physical examination, laboratory studies, including blood sedimentation rates, and serial x-rays are necessary.

Induction of Labour

Dieckmann and McCready (*Am. J. Obstet. & Gynec.* **54** : 496, 1947) give in the following lines the summary of their observations :

Termination of pregnancy by induction of labor after thirty-two weeks has less indication today than it had twenty years ago. It is inevitable followed by an increased maternal and fetal morbidity and mortality irrespective of how carefully the cases are selected.

The indications for induction of labor are selected cases of placenta previa, abruptio placentae, eclampsia and non-convulsive toxemia of pregnancy.

In the hemorrhagic groups the patients should be delivered vaginally if they possibly can be without undue hemorrhage.

In the toxemic patients one must evaluate the condition of the cervix and the severity of the toxemia. If the latter permits delay, the cervix will change and permit relatively safe induction of labor.

Induction of labor for postmaturity, contracted pelvis, convenience of patient or doctor is contraindicated.

Rupture of the membranes is the simplest and safest means of inducing labor.

Spontaneous rupture of the membranes does not necessarily imply that induction by some other means must follow.

The incidence of attempted induction of labor on our service is 3·2 per cent, and of failure is 9 per cent.

Castor oil or castor oil and quinine have no place in induction of labor.

A vaginal examination using sterile technique should proceed all attempts at inducing labor. A careful evaluation of the pelvis, the determination of the presenting part and the exclusion of a concealed prolapse of the cord as well as the condition of the cervix must be determined. If the cervis is "ripe" labour can be successfully induced and delivery completed within twenty-four hours in over 80 per cent of the patients.

Neutral Diet and Hydration of Toxaemias of Late Pregnancy

De-Alvarez (*Am. J. Obstet. & Gynec.*, **54** ; 445, 1947) give in the following lines the summary of his observations :

Patients with toxemias of late pregnancy are generally managed conservatively.

Toxemias of pregnancy are treated according to a conservative regimen, consisting of hydration, neutral diet, ammonium chloride, bed rest, and mild sedation.

Conservative therapy of pregnancy toxemia embodies the modern principles of water balance.

When conservative methods fail to control pregnancy toxemia, termination of pregnancy is effected by the most conservative means suited to the particular individual.

The latent sequelae following pregnancy toxemia are minimized by such conservative therapy.

The indications for cesarean section in toxemia patients should be essentially the same as when no toxemia exists.

Gonorrhoea in Gynaecology

Peters (*Am. J. Obstet. & Gynec.*, **54** : 517, 1947) presents three hundred seventeen cases of gonorrhea in women. These represented 13·8 per cent of all new cases entering a gynecology clinic for varying complaints in one year.

The most frequent symptom complained about in this group was abdominal pain. Almost one-fourth of the patients presented themselves because of menstrual disturbances. Stress is laid upon this symptom in early gonorrhea. Bacteriologic examination of women with a history of menstrual disturbances is urged.

Menstrual disturbances in gonorrhea are a frequent finding. In our series it took precedence over the most widely quoted triad of symptoms of urinary frequency, urgency and vaginal discharge. In our experience it is important to make bacteriological studies on women even in the presence of bleeding. The so often quoted "higher level of suspicion" must be applied to patients in gynaecological practice in order to prevent the tragedies of chronic gonorrhea which are only too familiarly seen on the operating table.

Rheumatic Recrudescences : Diagnosis and Prevention

Hansen (*J. Pediat.* **28** : 296, 1946, Ref. *Am. J. Dis Child.*, **73** : 734, 1947) writes that one of the most characteristic features of rheumatic fever is its propensity to occur in repeated attacks, and it is these recurrences or recurdescences which cause the high death rate and high incidence of disability from damaged heart in children and young adults.

Less than 1 per cent of those afflicted die during the first attack ; yet long term follow-up studies disclose that within ten to twenty years 25 to 40 per cent have succumbed to the diseases mostly because of the effects of the repeated attacks. Military experience in World War II revealed both high incidence of disability due to previous rheumatic heart disease and the occurrence of a surprising number of acute attacks of the disease, which in most instances represented recrudescences of previous rheumatic afflictions. Hence, one of the chief problems of rheumatic fever concerns control of the recurrences. In this presentation rheumatic recrudescences are discussed from the viewpoint of (1) general features, (2) manifestations, (3) diagnosis and (4) methods of prevention.

From 66 to 85 per cent of children with rheumatic fever have one or more recurrences. The younger a child is at onset of the disease the longer is the period in which recurrences may develop ; however, recurrences before and after the age of 16 years are in the ratio of 5 to 1. Fully four-fifths of the recrudescences develop within five years after an attack of rheumatic fever, but experience in the military forces during the war indicate that often many years may intervene between first attack and a recurrence. Recurrences may manifest themselves in a variety of ways. In about 75 per cent of the children with acute rheumatic fever the onset is characterized by (1) polyarthritis, (2) mild articular pains or (3) rheumatic encephalitis (chorea) equally distributed. However, in the course of years 66 per cent will have attacks of severe polyarthritis, the same percentage will have attacks of mild articular pains, and 45 per cent will have chorea. Only 3 per cent will have an onset characterized by severe carditis without other manifestations, and only 1 per cent will have congestive failure during the initial attack. Eventually, 75 to 80 per cent will develop severe carditis, and 25 per cent will have experienced congestive failure.

The great variety of manifestations of rheumatic fever which may be present in a recrudescence often makes differential diagnosis difficult. A series of studies revealed that when pain was a pronounced feature the diseases most apt to be confused in the differential diagnosis of rheumatic fever were ; appendicitis, poliomyelitis, osteomyelitis and rheumatoid arthritis.

Much has been accomplished in recent years to prevent recrudescences. Proper convalescent care and supervision are of prime importance, and change in climate may be worthy of consideration. The continuous use of sodium salicylate for a month following a throat infection with group A hemolytic streptococci appears to prevent a rheumatic flare-up from developing. Economic factors preclude the wide use of such a measure. Immunizations with tannic acid precipitated toxins of hemolytic streptococci seem to offer distinct benefit. The most widespread method of prevention is to administer relatively small amounts of sulphanilamide (0·6 gm. twice daily) or sulphamerazine or sulphadiazine (0·5 gm. twice daily) continuously. Smaller doses may be used for the younger children. There should be no signs of activity of the rheumatic infection when such therapy is started, and it is necessary to keep the patient under careful observation by the physician with periodic examination of the blood and the urine when sulphonamide compounds are used prophylactically. Many workers have reported studies comprising an experience of 1,561 patient-seasons, and it has been found that the recurrences were only 1·5 per cent in those patients given sulphonamide compounds in contrast to 19 per cent for control patients who were not given the drug. Further work is necessary to determine how long such therapy should be continued. For children it would appear that such a regimen should be carried on for five years following an attack of the disease, or until the age of 17 years, when recrudescences are less likely to develop. Nonetheless, it should be emphasized that the physician who takes care of the child with rheumatic fever should have him under careful scrutiny at all times ; thus much may be done to reduce the high mortality and disability in rheumatic fever by the prevention of recurrences.

Calculation of Normal Weight

Massler (*Child Development*, **16** : 111, 1945 Ref. *Am. J. Dis. Child.*, **73** : 727, 1947) writes that if the human body is regarded as an irregular cylinder, its weight can be expressed as :

$$\frac{\text{(Mean Circumference)}}{K} \times \text{Height} \times \text{Specific Gravity.}$$

The mean circumference of the body was found to be best expressed at the level of the xiphoid process after quiet expiration for both male and female at all ages from birth to old age. Specific gravity taken after quiet expiration revolves about 1·0 as a mean but varies slightly at different ages, in different types of body and in males and females. The formula was tested in more than 1,000 healthy subjects ranging in age from birth to 50 years and finally derived as :

$$\frac{\text{(Circumference of chest at xiphoid)}^2}{4{\cdot}0} \times \text{Height} \times 1{\cdot}0 =$$

Calculated Weight.

The predictive value of the formula was found to be good in the majority of cases. The coefficient of correlation between calculated and observed weight was 0·82. Measurement is not difficult in technic but must be done carefully. The technic is described and two monograms are appended to facilitate calculation.

Oral Penicillin in Young Children

Suchett-Kaye and Latter (*Brit. M. J.*, **2** : 953, 1947) write that twenty-five young children were treated with oral penicillin. Of these 18 had bronchopneumonia, 5 lobar pneumonia, and 1 bronchitis ; the remaining child was removed to a fever hospital with measles.

Of those with bronchopneumonia 11 made a satisfactory recovery on oral penicillin alone, 3 greatly improved but did not complete the course, and 4 failed to respond and were treated successfully with sulphonamides. Of those with lobar pneumonia 4 recovered on oral penicillin and 1, much improved did not complete the treatment. One child with acute bronchitis recovered quickly in three days on oral penicillin.

In 21 children, all under the age of 2, serum-penicillin levels were estimated after a single oral dose varying from 10,000 to 40,000 i.u. ; no penicilllin was detected after three hours. The preparation used was calcium penicillin with sodium citrate.